Brady Wind Energy Center
Wildlife Conservation Strategy

Prepared for:

Brady Wind, LLC

Prepared by:

Tetra Tech Inc.
350 Indiana Street, Suite 500
Golden, Colorado 80401

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Acronyms and Abbreviations

APLIC	Avian Power Line Interaction Committee
BBS	Breeding Bird Survey
BCC	Birds of Conservation Concern
BCR 17	Badlands and Prairies Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
Brady Wind	Brady Wind Energy, LLC
CBC	Christmas Bird Count
CFR	Code of Federal Regulations
cm	centimeters
CRP	Conservation Reserve Program
ECP Guidance	*Eagle Conservation Plan Guidance, Module 1 – Land-based Wind Energy: Version 2*
ESA	Endangered Species Act
GIS	Geographic Information System
m	meters
MBTA	Migratory Bird Treaty Act
MW	megawatts
NDGF	North Dakota Game and Fish Department
NDME	Medora Christmas Bird Count
NLCD	National Land Cover Database
NLEB	northern long-eared bat
NWR	National Wildlife Refuge
Project	Brady Wind Energy Center
RSA	rotor-swept area
Tetra Tech	Tetra Tech, Inc.
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WCS	Wildlife Conservation Strategy

WEG	USFWS Wind Energy Guidelines
WNS	White-nose Syndrome
WPA	waterfowl production area
WRRS	Wildlife Response and Reporting System

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1.0 INTRODUCTION

Brady Wind Energy, LLC (Brady Wind), a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC, is developing the Brady Wind Energy Center (Project) in Stark County, North Dakota (Figure 1). Brady Wind is committed to environmental due diligence, and contracted Tetra Tech, Inc. (Tetra Tech) to assess potential wildlife impacts resulting from Project construction and operation. Brady Wind has voluntarily developed and implemented this Wildlife Conservation Strategy (WCS) in its continued efforts to demonstrate due diligence in avoiding and minimizing impacts to avian and bat species in association with the development and operation the Project. This WCS describes Brady Wind's strategy to address wildlife conservation in all phases of Project development.

1.1 Statement of Purpose

There are potential wildlife impacts resulting from construction and operation of a wind energy facility. This WCS outlines various processes that Brady Wind has employed or will employ to:

1) Comply with all state and federal wildlife conservation and protection laws and regulations at the Project;
2) Ensure that impacts to wildlife resources, particularly birds and bats, are identified, quantified, and analyzed; and
3) Implement various avoidance and minimization measures to address unanticipated impacts that result from the operation of the Project.

Interactions of birds and bats with generating facilities (including wind turbines, transmission and distribution lines, substations, and other associated structures and equipment) may be associated with injury or mortality. Additionally, construction activities my affect habitat value for some species of wildlife. Bird interactions can result in power outages, which in turn could lead to grass and forest fires, raising safety concerns. Generating facilities also have the potential to impact bats. Impacts to birds and bats may raise concerns by employees, resource agencies, and the general public. Therefore, impacts on birds, bats, and other wildlife that occur as a result of the Project are important to Brady Wind as both a regulatory and natural resource conservation priority.

1.2 Corporate Policy

Brady Wind is committed to siting, constructing, operating, and decommissioning the Project in an environmentally responsible and sustainable manner. This includes minimizing impacts to natural resources, such bird and bat species and the habitats they use. As part of this commitment, Brady Wind has developed this WCS for the Project. The objective of this WCS is to ensure that:

- All Project-related actions comply with federal and state regulations pertaining to birds and bats;
- All Project-related actions comply with conditions of existing permits with respect to wildlife;
- Avoidance and minimization measures designed for Project-specific wildlife species concerns are implemented;
- Effective documentation of bird and bat injuries and fatalities will occur to provide the basis of ongoing adaptive management and development of avian protection procedures; and
- Brady Wind staff and all relevant subcontractors will receive the appropriate training pursuant to avian and bat monitoring and reporting.

1.3 Agency Coordination History

Brady Wind has coordinated with the North Dakota Game and Fish Department (NDGF), the North Dakota Parks and Recreation Department, and the North Dakota field office of the U.S. Fish and Wildlife Service (USFWS) as part of the development of the Project (Table 1). Copies and records of correspondence can be found in Appendix A.

2.0 REGULATORY FRAMEWORK

Native birds are protected under a variety of federal and state laws and regulations. With regard to the Project, these laws and regulations include the Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), and the Bald and Golden Eagle Protection Act (BGEPA).

2.1 Migratory Bird Treaty Act

The MBTA implements the Unites States' obligations under four treaties for the protection of migratory birds. The MBTA is administered by the USFWS, which maintains a list of all species protected by the MBTA (50 Code of Federal Regulations [CFR] 10.13). This list includes over 1,000 species of migratory birds, including eagles and other raptors, waterfowl, shorebirds, seabirds, wading birds, and passerines.

The MBTA makes it unlawful "by any means or in any manner, to pursue, hunt, take, capture, kill … possess, offer for sale, sell … purchase … ship, export, import …transport or cause to be transported… any migratory bird, any part, nest, or eggs of any such bird …" except as otherwise permitted under the regulations. (16 United States Code [USC] 703). The USFWS has interpreted the MBTA to be a strict liability statute, meaning that proof of intent, knowledge, or negligence is not an element of an MBTA violation. Actions resulting in the "take" of a

protected species, in the absence of a USFWS permit or regulatory authorization, are a violation.

The word “take” is defined by regulation as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect”. (50 CFR 10.12). The MBTA does not have a provision directly prohibiting incidental takes and the definition of “take” does not include the broader terms of “harass” or “harm” that have been found to prohibit incidental takes under the Endangered Species Act. Indeed, in the historic context of the MBTA, and an interpretation supported by the U.S. Court of Appeals for the 8th Circuit, the term “take” refers to conduct directed at birds, such as hunting or poaching, and not on prohibiting lawful, commercial activity which may indirectly cause bird deaths. (See U.S. v. Brigham Oil and Gas, L.P., 840 F.Supp. 2d 1202 (D. N.D. 2012)).

USFWS has established a permitting scheme for a variety of intentional activities, such as hunting and scientific research and has also worked with industries to find ways to minimize impacts to migratory birds. Since the scope of USFWS’ legal authority to regulate incidental takes remains unclear, as the 8th Circuit’s interpretation is not accepted by all courts, USFWS has not been deterred from attempting to regulate incidental takes under the MBTA. USFWS has historically pursued individual prosecutions for incidental takes and more recently, has proposed an incidental permitting program.

2.2 Bald and Golden Eagle Protection Act

Under authority of the BGEPA (16 USC 668–668d), bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are afforded additional legal protection. The BGEPA prohibits the take, sale, purchase, barter, offer of sale, purchase, or barter, transport, export or import, at any time or in any manner of any bald or golden eagle, alive or dead, or any part, nest, or egg thereof (16 USC 668). The BGEPA also defines take to include “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb” (16 USC 668c), and includes criminal and civil penalties for violating the statute (16 USC 668). The term “disturb” is defined as agitating or bothering an eagle to a degree that causes, or is likely to cause, injury to an eagle, or either a decrease in productivity or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior (50 CFR 22.3).

USFWS promulgated regulations in 2009 that provided for a permitting framework for incidental take associated with otherwise lawful activities, including wind energy, under the existing BGEPA (50 CFR 22.26). Applications for incidental take permits under BGEPA are being considered by USFWS for bald eagles throughout the contiguous United States. Incidental take permits for golden eagles are available only to projects located west of the 100th meridian, thus the Project would qualify (USFWS 2013a). However, since 2009, only one incidental take permit for golden eagles has been granted to a wind energy project, and no permits for incidental take of bald eagles at a wind energy facility have been issued. USFWS issued an Advanced Notice of Rulemaking in April 2012, and is currently undergoing a process to revise the permit regulations in response to public comment relative to eagle population management objectives,

compensatory mitigation, and programmatic permit issuance. It is unknown at this time what changes will be made or how they may affect the permitting process. The Draft Eagle Conservation Plan Guidance, that outlines the recommended steps for permit applicants, was released by USFWS in February 2011 (USFWS 2011a), with revised technical appendices released in August 2012 (USFWS 2012b). USFWS released *Eagle Conservation Plan Guidance, Module 1 – Land-based Wind Energy: Version 2* (ECP Guidance; USFWS 2013a) in April 2013.

2.3 Endangered Species Act

The ESA directs USFWS to identify and protect endangered and threatened species and their critical habitat, and to provide a means to conserve their ecosystems. Among its other provisions, the ESA requires USFWS to assess civil and criminal penalties for violations of the ESA or its regulations. Section 9 of the ESA makes it unlawful to knowingly violate the "take" provisions of the ESA. "Take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" (16 USC 1532). Significant modification or degradation of listed species' habitats where the modification actually kills or injures wildlife by significantly impairing essential behavioral patterns is considered "harm" under ESA regulations.

2.4 Non-regulatory Framework

In addition to regulatory drivers, the WCS also briefly discusses bird species included on the USFWS list of Birds of Conservation Concern (BCC). Although these species are not formally protected under any regulatory laws, BCC species are closely monitored by USFWS due to population declines and/or rare occurrences in a specific region. As a result, BCC species that might be encountered at the Project are included in this WCS. Development of the BCC category for birds was the result of a 1988 amendment to the Fish and Wildlife Conservation Act that mandates the USFWS identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the ESA. The overall goal is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions. The BCC categorization is intended to stimulate coordinated and collaborative proactive conservation actions among federal, state, tribal, and private partners (USFWS 2008a). The proposed Project Area is located in the Badlands and Prairies Bird Conservation Region (BCR 17) and only BCC species for this region are discussed in the WCS.

2.5 State Protection

The protection and regulation of species not listed under the federal ESA is typically at the discretion of state wildlife agencies. North Dakota does not have a state endangered or threatened species list, and only those species listed by the ESA are considered threatened or endangered in North Dakota. NDGF has identified 100 species of conservation priority, or those

in greatest need of conservation in the state (Dyke 2014) to aid in managing these species and prioritizing their conservation; however, these species are not afforded regulatory protection.

Species are categorized into three levels according to conservation need:

- Level I – species in greatest need of conservation;
- Level II – species in need of conservation, but have had support from other wildlife programs; and
- Level III – species in moderate need of conservation, but are believed to be on the edge of their range in North Dakota.

3.0 PROJECT DESCRIPTION

3.1 Project Components

The Project has a proposed nameplate capacity of approximately 150 megawatts (MW), anticipated to consist of 80 GE 1.7-MW Xle wind turbine generators and 7 GE 1.79-MW Xle wind turbine generators (Figure 2). The Project also includes a planned approximately 19-mile, 230-kilovolt overhead transmission interconnect line. Additional Project facilities include access roads, electrical collection systems and cabling, a collection substation, an operation and maintenance building, meteorological towers (nine temporary and one permanent), a construction laydown area, and a temporary turbine storage area.

The Project is located within a 29,983 acre (approximately 47 square miles) Project Area (not including land for the transmission line structures and right-of-way). Turbines and other project facilities will be placed on participating land throughout the Project Area, Project structures will occupy only 109.5 acres during operation, or less than 1 percent of the total Project Area. The Project Area (not including the transmission line) ranges from 1.5 to 5 miles long between its north and south boundaries, and approximately 17 miles wide between its west and east boundaries. The transmission line is approximately 19 miles in length and would have an associated 150-foot wide right-of-way that would be used for construction and maintained during the life of the Project. The transmission line would connect the proposed Brady Wind Energy Center's collection substation in the southeast corner of 52nd Street SW and 109th Avenue SW (in the northwest quarter of Section 25 in Township 137 North, Range 96 West) with the existing Belfield to Rhame 230-kilovolt transmission line that is owned and operated by Basin Electric Power Cooperative in the southwest corner of the southeast quarter of Section 20, Township 139 North, Range 98 West (Figure 2).

3.2 Site Description

3.2.1 Tier 1 Evaluation Area

In May 2015, Brady Wind conducted a desktop analysis of an 181,768-acre evaluation area consistent with Tier 1-Preliminary Site Evaluation recommendations of the USFWS Wind Energy Guidelines (WEGs, USFWS 2012a) to assess the potential for adverse effects on species of concern and their habitat. The results were evaluated to determine the location of the proposed Project (Figure 3). As part of the initial site screening, Tetra Tech evaluated existing, publicly available Geographic Information System (GIS) data for the proposed Project Area, including land ownership, National Land Cover Database (NLCD), U.S. Geological Survey (USGS) Ecoregions, the National Wetlands Inventory, the National Hydrography Database, Federal Emergency Management Agency floodplains, and known eagle nest data provided by NDGF, as well as eagle nests located by Tetra Tech during spring 2015 aerial raptor nest surveys. These spring 2015 aerial raptor nest surveys were conducted in support of a different proposed wind energy facility (now canceled), approximately 15 miles to the northeast of the proposed Project Area. Within the 181,768-acre evaluation area, the location of the proposed Project Area was selected over other evaluated areas in part because it is farther from known bald and golden eagle nests. Other factors that influenced the selection of the proposed Project Area were input from local officials, wind resource, interested landowners, and proximity to transmission.

The Project Area is located in the Missouri Plateau subregion of the Northwestern Great Plains Ecoregion (Bryce et al. 1996). The area is unglaciated, and topography includes rolling plains with isolated sandstone buttes. Elevation ranges from 1,750 to 3,300 feet. The area receives 15 to 17 inches of precipitation annually and average daily temperatures range from 21 degrees Fahrenheit in January to 83 degrees Fahrenheit in July. Dryland farming and cattle grazing are the primary land uses in the area.

The Tier 1 preliminary site evaluation and coordination with USFWS identified species of concern with the potential to occur within the Project Area. During the December 16, 2015 coordination meeting between Brady Wind and the USFWS, USFWS identified the Dakota skipper (*Hesperia dacotae*) and the gray wolf (*Canis lupus*) as potentially present in the vicinity of the Project, even though they did not appear on the county lists (K. Shelley, USFWS, pers. comm. 2015).

The following species are evaluated in detail to determine the likelihood of occurrence within the Project Area in Section 4.1:

- Whooping crane (Federally Endangered)
- Black-footed ferret (Federally Endangered)
- Gray wolf (Federally Endangered)
- Northern long-eared bat (Threatened)

- Bald eagle (Federally Protected)
- Golden eagle (Federally Protected)
- Sharp-tailed grouse (Level II state-listed Species of Conservation Priority)
- Dakota skipper (Federally Threatened)

3.2.2 Tier 2 Project Area

Consistent with Tier 2-Project Area Evaluation recommendations of the WEG, field evaluations were conducted at the proposed Project Area. During the ground-based raptor nest surveys of the Project Area in June and August 2015, a biologist observed habitats and site conditions, which were then used to evaluate the initial results of the desktop study and to inform the assessment of the potential occurrence of sensitive wildlife resources. In addition, a desktop native prairie assessment was completed in September 2015, concluding that approximately 12,480 acres (45 percent) were potential native prairie and 15,115 (55 percent) were non-native. Subsequently, a Project re-design to avoid non-wildlife constraints, wetlands, and high quality native prairie modified the Project Area. Another assessment was conducted in November 2015. The November assessment determined that approximately 6,272 acres (21 percent) of a 29,983-acre Project Area was potential native prairie and 23,711 acres (79 percent) was non-native (Tetra Tech 2015a). The site visits confirmed that the existing land use in the Project Area is primarily cropland (wheat and alfalfa) and cattle ranches, and that there is remnant native prairie that mostly occurs in areas of steep topography. There are residences and a few abandoned farmsteads scattered throughout the Project Area.

There are no major rivers or lakes within the Project Area; however, the Project Area contains numerous small streams and wetlands that vary from shallow vegetated depressions to man-made cattle ponds and intermittent creeks. The closest major river is the Cannonball River, located approximately 5 miles to the southwest of the Project (Figure 1). There are few wetlands evident that are not associated with a stream system. Trees and forested areas are sparsely scattered throughout the Project Area and are restricted mainly to riparian areas and to windbreaks around fields and residences. The topography within the Project Area primarily consists of rolling plains, and lacks prominent landscape features (e.g., hills, valleys); the elevation within the Project Area ranges from 2,527 to 2,920 feet above mean sea level.

3.2.3 Baseline Habitat Management

The habitat within the Project Area is primarily agriculture and pasture vegetation typical of North Dakota. According to the NLCD, the majority of the Project Area is cultivated crops (55 percent) and grassland/herbaceous (25 percent) (Table 2, Figure 4), all of which is managed by private landowners. Crops grown in the ecoregion include spring wheat, barley, oats, and sunflowers. The NLCD shows 4,296 acres of pasture/hay, and based on field observations (S. Chan pers. comm, NextEra, 2016), 26 parcels comprising 3,902 acres (13 percent) of the

Project Area were being grazed by cattle (Figure 5). There are no federally managed habitats within the Project Area.

4.0 PROJECT HISTORY OF BIRD AND BAT PRESENCE AND RISK ASSESSMENTS

4.1 Tier 1: Preliminary Site Evaluation

4.1.1 Decision to Abandon or Move Foreword

4.1.1.1 Are Species or Habitats of Concern Present?

Native prairie and the following special-status wildlife species were identified as potentially present within the Project Area and were therefore evaluated in detail to determine the likelihood of occurrence within the proposed Project Area and potential risks to these species and their habitats.

Habitat

Native Prairie

Based on the desktop native prairie assessment, approximately 6,272 acres (21 percent) of the 29,983-acre proposed Project Area were identified as potential native prairie and 23,711 acres (79 percent) was determined to be non-native prairie. USFWS identified native prairie as a habitat of concern because it may support the Dakota skipper or grassland bird species of habitat fragmentation concern. See Section 5.1 for details.

Birds

Whooping Crane

The northeast portion of the Project Area is located on the western edge of the whooping crane migration corridor (Figure 6). A desktop assessment concluded that there is a low likelihood of occurrence of this species within the Project Area. See Section 5.2 for a detailed analysis.

Sharp-tailed Grouse

Sharp-tailed grouse occur in areas dominated by relatively dense herbaceous cover and shrubs, and the habitat within the Project Area may therefore be suitable for the species. The likelihood of occurrence is high. See Section 5.2 for a detailed analysis.

Bald Eagle

Bald eagles are likely to occur in the vicinity of the Project Area. There are two known bald eagle nests within 10 miles of the Project Area (Figure 3). Due to the proximity of nests to the Project Area, the likelihood of occurrence is high. See Section 5.2 for a detailed analysis.

Golden Eagle

Golden eagles may occur year-round in North Dakota. According to NDGF, there are golden eagle nests within 10 miles of the Project Area; the likelihood of golden eagle occurrence is therefore high. See Section 5.1 for a detailed analysis.

Mammals

Northern Long-Eared Bat

The northern long-eared bat (NLEB) is the only listed bat species with the potential to occur within the Project Area and therefore was evaluated in detail to determine the likelihood of occurrence within the Project Area and the potential risks to this species and its habitat. This species' range includes Stark County, and it has been detected in Hettinger County (USFWS 2013c, 2014a; BCI 2014; Western and USFWS 2015). However Stark and Hettinger counties are outside the White-nose Syndrome (WNS) buffer where incidental take due to hibernacula disturbance or tree removal is prohibited under the final 4d rule. The species has a low likelihood of occurrence in the Project Area. See Section 5.3 for a detailed analysis.

Black-Footed Ferret

The black-footed ferret, a medium-sized member of the weasel family, was listed as endangered in 1967 (USFWS 2014c). The black-footed ferret is an obligate predator of prairie dogs and occurs exclusively in prairie dog colonies which it depends upon for food and shelter (USFWS 2014c). Previously believed extinct, 18 individuals were discovered in 1986 and were then used to develop a breeding and reintroduction program (USFWS 2010b). It is estimated that over 1,000 black-footed ferrets occur in the wild with another 300 within breeding facilities (USFWS 2014c). Although it is thought to be extirpated from the state (NDGF 2012), there was an unconfirmed report of a black-footed ferret sighting near the town of Dickinson, north of the Project in 2012. The USFWS is not aware of any black-footed ferrets in the vicinity of the Project (K. Shelley, USFWS, pers. comm.). No reintroductions of black-footed ferrets have been made in North Dakota (USFWS 2014c). Reintroductions were once considered in the area southwest of the town of New England, but this area is no longer under consideration for reintroductions (K. Shelley, USFWS, pers. comm.).

Black-footed ferrets only occur in large, contiguous prairie dog colonies, and the grassland habitat within the Project Area is highly fragmented, which precludes the formation of large, continuous colonies. There is one known prairie dog colony with the Project Area (Figure 5), and focused aerial surveys to detect prairie dog colonies (and other prey sources for raptors) were conducted on March 10 and March 24, 2016 and determined that colony was active. Based on the range, known reintroduction locations of black-footed ferrets, and habitat within the Project Area, it is unlikely the black-footed ferret would occur within the Project Area; therefore, this species was eliminated from further consideration in this WCS.

Gray Wolf

USFWS identified gray wolf as potentially present in the vicinity of the Project Area (K. Shelley, USFWS, pers. comm. 2015). The gray wolf was listed as endangered in 1974 (USFWS 2014d, 2014e). Gray wolves previously inhabited a large portion of the United States in a variety of habitats including tundra, forests, grasslands, and deserts. Although the gray wolf has been reported in Stark County (Western and USFWS 2015), the Project Area lacks forested areas known to support wolf pack establishment and persistence (USFWS 2012c; NatureServe 2014). Furthermore there is no known breeding population in North Dakota (NDGF 2015). Therefore, this species has been eliminated from further consideration in this WCS because there is a low to moderate likelihood of the species transiting the Project Area, but it is unlikely to maintain a local resident population.

Insects

Dakota Skipper

USFWS identified Dakota skipper is potentially present in the vicinity of the Project (K. Shelley, USFWS, pers. comm. 2015). Although there are no known occurrences within the Project Area, the native prairie survey indicates that suitable habitat for the species is present within the Project Area. The species has not been documented in the vicinity of the Project, and the likelihood of occurrence is therefore low. See Section 5.4 for a detailed analysis.

4.1.1.2 Does the Landscape Contain Areas Precluded by Law or Areas that are Designated as Sensitive?

USFWS, the U.S. Forest Service, and NDGF maintain conservation areas to help preserve habitats critical to migratory birds and other sensitive species (e.g., recreation areas, National Wildlife Refuges [NWRs], National Grasslands, state parks, and state wildlife areas). Based on both literature review and agency websites, there are no state or federal easements in the Project Area, such as National Grasslands or state wildlife areas (USFS 2011). The USFWS confirmed that there were no USFWS fee title lands or easements in the Project Area or along the transmission line route (Table 1). There is one USFWS waterfowl production area (WPA), the Hettinger County WPA, within 10 miles of the Project. The closest NWRs to the Project Area are White Lake NWR (approximately 15 miles southwest), Stewart Lake NWR (28 miles to the southwest), Pretty Rock NWR (approximately 42 miles to the southeast), and Lake Ilo NWR (approximately 42 miles north) (Figure 1). Additionally, the Tier 1 evaluation area contained known bald eagle and golden eagle nests. Brady Wind moved the Project Area in part to avoid these known nests, as well as suitable golden eagle nesting habitat. Other factors that influenced the selection of the proposed Project Area were input from local officials, wind resource, interested landowners, and proximity to transmission.

4.1.1.3 Are There Critical Areas of Wildlife Congregation?

There are no critical areas of wildlife congregation within the Project Area and the closest critical areas of wildlife concentration are the WPA and the NWRs discussed in Section 4.1.1.2.

4.1.1.4 Is There Potential to Fragment Large, Intact Habitats for Species that are Sensitive to Habitat Fragmentation?

The USFWS North Dakota Field Office lists 11 species of habitat fragmentation concern: Baird's sparrow, bobolink, chestnut-collared longspur, grasshopper sparrow, greater prairie-chicken, greater sage grouse, northern harrier, sedge wren, sharp-tailed grouse, Sprague's pipit, and upland sandpiper (USFWS 2013b). With the exception of the greater prairie-chicken and sedge wren, it is possible that these species could occur within the Project Area because of the presence of potentially suitable habitat. Much of the Project Area is already fragmented and in use as pasture or crop production. A network of county roads exists throughout the Project Area; although these roads are not barriers to wildlife movement, their presence disrupts the continuity of the landscape, contributing to habitat fragmentation. There are patches of native prairie that could be sensitive to habitat fragmentation; however, due to the existing fragmented nature of the Project Area, impacts are unlikely. In addition, Brady Wind has avoided siting turbines and other associated facilities in areas of high quality native prairie to the extent possible (Figure 7b).

4.2 Tier 2: Site Characterization

4.3 Abandon Site or Advance to Field Surveys to Support a Bird and Bat Conservation Strategy?

4.3.1.1 Are Plant Communities or Vegetation Habitats of Conservation Concern Present?

Native prairie was the only plant community of conservation concern detected within the Project Area during the Tier 1 Site Evaluation or Tier 2 Site Characterization. Using the results of the native prairie assessment (see Section 5.1), Brady Wind determined that high quality native prairie could be avoided to the extent possible by the Project.

4.3.1.2 What Species of Birds and Bats are Likely to Use the Proposed Site?

Birds

North Dakota has 353 documented bird species (Faanes and Stewart 1982), and is situated within the Central Flyway, one of several broad bird migratory routes in North America (USFWS 2011b). During fall migration, most birds that move along the Central Flyway travel from breeding grounds as far away as Alaska and northern Canada through the central states, eventually reaching wintering grounds near the Gulf of Mexico, and as far away as South America (USFWS 2011b). Resident and migratory birds use the Project Area for foraging, hunting, shelter, breeding and nesting, and possibly as a stopover site during migration.

Species present within the Project Area are likely to be common grassland/agriculture species of North Dakota. Waterfowl and waterbird species are likely to use the wetlands as breeding and migratory stopover areas. However, our analysis did not identify whooping crane habitat within ½ mile of the transmission line and fewer suitable wetlands in the Project Area compared

with the surrounding area (Section 5.2) did not identify any stopover habitat (Tetra Tech 2015b). Raptor species breeding in the Project Area are likely to be in low numbers, and mostly restricted to species adapted to open grassland and agriculture habitats such as great-horned owls (*Bubo virginianus*) and red-tailed hawks (*Buteo jamaicensis*). Grassland species have the potential to occur within the native prairie that occurs within the Project Area. To determine the species that are likely to use the Project Area, Tetra Tech reviewed the results from the closest National Audubon Society Christmas Bird Count (CBC) count circle and USGS Breeding Bird Survey (BBS) route, summarized below.

Christmas Bird Count

The closest CBC is the Medora Count (NDME) approximately 25 miles northwest of the Project Area (National Audubon Society 2010). There are 55 species and two unknown species that have been observed during the NDME over the last 10 years (2005–2014) (Table 3).

Breeding Bird Survey

The nearest USGS BBS is the Dickinson Survey Route (#64021), approximately 15 miles to the northwest of the Project Area and situated along similar agriculture, grassland, and riparian habitats. The Dickinson Survey Route has documented 100 species of birds that potentially breed in the area of which 10 are BCC species (Table 4). Most of these species prefer grassland habitat, agricultural areas, or wetland habitat. The Project Area is 69.1 percent agriculture (54.8 percent cropland and 14.3 percent pasture/hay), 24.8 percent grassland/herbaceous habitat, and less than 1 percent wetland habitat, indicating that similar species could breed in the Project Area. The exception to this involves species that prefer wetlands, which may occur in fewer numbers due to the paucity of wetlands within the Project Area.

Birds of Conservation Concern

The Project Area is in BCR 17 (USFWS 2008a). There are 28 BCC species listed within BCR 17 that may also occur within the Project Area (Table 5). None of the species are currently listed as federally endangered or threatened. Two species are non-breeding migrants (horned grebe and peregrine falcon) that may pass through the region, and possibly the Project Area, during spring and fall migration. Three BCC species were observed during or incidentally to avian surveys (bald eagle, golden eagle, and ferruginous hawk; see Section 5.2.2.2).

BCC species were detected during the nearby CBC and BBS surveys. Four BCC species (loggerhead shrike, bald eagle, golden eagle, and short-eared owl) have been observed within the last 10 years during the NDME. There have been no federally listed threatened or endangered species observed during the NDME. Ten BCC species have been detected along the nearby BBS route, six of which (grasshopper sparrow, chestnut-collared longspur, loggerhead shrike, Sprague's pipit, ferruginous hawk, and short-eared owl) are found in grasslands and/or agricultural habitat, and therefore also could be found within the Project Area. The remaining four BCC species (American bittern, marbled godwit, red-headed woodpecker, and black-billed cuckoo) prefer wetlands or woodlands. Both of these habitats each comprise

less than 1 percent of the Project Area, and therefore it is not expected that these species would occur within the Project Area. NDGF has noted presence of burrowing owls in the vicinity of the Project Area.

Avian Species of Habitat Fragmentation Concern

The USFWS North Dakota Field Office lists 11 species of habitat fragmentation concern: Baird's sparrow, bobolink, chestnut-collared longspur, grasshopper sparrow, greater prairie-chicken, greater sage grouse, northern harrier, sedge wren, sharp-tailed grouse, Sprague's pipit, and upland sandpiper (USFWS 2013b). With the exception of the greater prairie-chicken and sedge wren, it is possible that these species could occur within the Project Area due the presence of potentially suitable habitat. Species detected within 25 miles of the Project Area include Baird's sparrow, bobolink, chestnut-collard longspur, grasshopper sparrow, northern harrier, sedge wren, sharp-tailed grouse, Sprague's pipit, and upland sandpiper (Tables 3 and 4).

Bats

Of the 11 bat species known to occur in North Dakota (Gullickson n.d., BCI 2014), available information about species-specific suitable habitat, known distribution ranges, and documented occurrences indicate that five species are expected to have a moderate or high potential to occur within the vicinity of the Project Area. Three of the bat species with a moderate or high likelihood of occurring in the Project Area (silver-haired bat [*Lasionycteris noctivagans*], hoary bat [*Lasiurus cinereus*], and eastern red bat [*Lasiurus borealis*]) migrate to southern latitudes during winters. The remaining species, big brown bat (*Eptesicus fuscus*) and little brown bat (*Myotis lucifugus*), hibernate locally or regionally. None of these species are federally listed under the ESA.

Non-developed and non-agricultural types of habitats (open water, forested, wetlands, and shrub/scrub) provide the best foraging opportunities for bats, and account for less than two percent of the Project Area. Although there is evidence (Rogers et al. 2006; BCI 2014; Gilliam and Barnhart 2011) to indicate that some species, such as the big brown bat, prefer foraging over agricultural lands (cultivated crops and pasture/hay), agricultural lands within the Project Area are typically the least suitable locations for foraging, and account for approximately 69 percent of the Project Area.

The Project Area contains small forested riparian corridors that bats could follow or use as day roosting sites, although these are not significant features from a regional perspective. There are no known winter bat hibernacula within the Project Area. There are no caves or other natural rock or crevice formations in the Project Area that would be suitable hibernacula (Murphy 2007; NDGS and NDDH 2001). All known caves are greater than 11 miles from the Project Area. The closest caves are Bear Cave, 11.5 miles to the southwest, and Snow Cave, approximately 28 miles to the southwest (Figure 3). Bear Cave extends only 12 feet into the rock, and Snow Cave has been destroyed by falling rock and erosion (Murphy 2007). There are no abandoned mines within the Project Area; the closest mines that could provide potential roosting habitat for bats are approximately 5 miles south of the Project Area (NDPSC 2013). The suitability of these

mines for roosting bats is unknown. The limited roosting habitat and hibernacula within the Project Area is a major limiting factor for use of the Project Area by migrating bats. Therefore, bat migration through the Project Area is likely low in magnitude.

Roosting colonies of big brown bat and little brown bat have a high probability of occurring within the Project Area because of their known association with edge habitats and human-made structures. Eastern red bat, hoary bat, and silver-haired bat have a moderate likelihood of occurring in the Project Area, primarily during migration. The eastern red bat, hoary bat, and silver-haired bat are all associated with forested habitats and would most likely occur in small woodlots while moving through the Project Area during migration. Each of these species are found in North Dakota from May through September (Cryan 2003; Cryan and Veilleux 2007).

The remaining six species found in North Dakota (fringed bat [*Myotis thysanodes*], long-eared bat [*Myotis evotis*], long-legged bat [*Myotis volans*], western small-footed bat [*Myotis ciliolabrum*], Townsend's big-eared bat (*Corynorhinus townsendii*), and northern long-eared bat [*Myotis septentrionalis*]) are expected to have a low likelihood of occurrence in the Project Area based upon species range, known habitat associations, and occurrence of similar habitats within the Project Area.

4.3.1.3 Is There Potential for Significant Adverse Impacts to Those Species?

The Tier 1 and Tier 2 evaluation results show low potential for significant adverse impacts regarding birds, bats, or other wildlife species or their habitats within the Project Area. Based on the habitat present, abundance of cultivated crops, and the distance from major waterbodies and other wildlife attractants, no significant, unavoidable adverse impacts to species or habitats of concern were identified.

4.3.1.4 Is There a High Probability of Significant Adverse Impacts That Cannot be Avoided or Minimized?

The site-specific characterization was consistent with the Tier 1 Site Evaluation in that there was a low probability of significant adverse impacts on wildlife or their habitats. Therefore, Brady Wind decided to move forward with focused field studies of the Project Area to further evaluate the presence of bird and bat species. The data from those studies are used to inform this WCS.

5.0 TIER 3: FIELD STUDIES

Based on the results of the Tier 1 and Tier 2 analysis, Brady Wind conducted Tier 3 field studies in accordance with the USFWS Land-based WEGs to better understand risks to wildlife from development of the Project. Surveys conducted at the Project are summarized in Table 6 and described in detail in this section.

5.1 Habitat Assessment

5.1.1 Methods

Native prairie was evaluated for suitability for species dependent on native grasslands, with a focus on the Dakota skipper and Sprague's pipit. At the time the evaluation was completed, the Sprague's pipit was a candidate for listing under the ESA; however, the listing has since been determined to be not warranted and we will only report on habitat suitability as it relates to the Dakota skipper. In July 2015, Tetra Tech conducted an initial desktop native prairie assessment for the proposed Project; an additional 2,431 acres was assessed via desktop in October 2015 when the proposed Project Area expanded. The desktop assessments preliminarily classified areas of potential native prairie within the Project Area using the following GIS and spatial imagery data:

- 2011 NLCD land cover data (Homer et al. 2015);
- U.S. Department of Agriculture cropland data (USDA 2013);
- National Agriculture Imagery Program aerial photographs (USGS 2014); and
- Google Earth Pro (2014).

The NLCD and cropland data were clipped to the Project Area and were viewed in Google Earth Pro. The Project Area was also overlaid on National Agriculture Imagery Program aerial imagery. Using the above data sources, areas that appeared to contain native prairie vegetation were delineated on hardcopy maps and then digitized using ArcGIS software.

Field verification of the July 2015 desktop native prairie assessment was conducted concurrently with fall avian surveys on August 20, 2015 by a Tetra Tech biologist. The biologist visually assessed areas delineated as potential native prairie during the desktop habitat assessment from public rights-of-way to confirm the presence of native prairie and classify potential Dakota skipper and Sprague's pipit habitat. Visual assessment of a few portions of the Project Area was not possible due to lack of access from public rights-of-way. The areas that were not visible from the roads, and thus were not visually assessed, were classified as "Undetermined." Polygons or portions of polygons delineated as potential habitat during the desktop habitat assessment were excluded from consideration as potential habitat if during field verification surveys they were determined to be hayfields. Because species composition of grassland habitats could not be identified based on desktop review, potential native prairie identified in the desktop analysis included other apparently similar land cover types such as tame grassland (grasslands comprised primarily of non-native species) and hayfields.

Additionally, major vegetation cover types were characterized in a desktop analysis, described in detail in Section 3.2.3. Major avian habitat types were confirmed during initial site visits to setup the avian surveys described below.

5.1.1.1 Results

Approximately 6,272 acres (21 percent) of the 29,983-acre proposed Project area were identified as potential native prairie and 23,711 acres (79 percent) was determined to be non-native prairie based on the desktop assessment. Because species composition of grassland habitats could not be identified based on desktop review, potential native prairie identified in the desktop analysis included other apparently similar land cover types such as tame grassland (i.e., grasslands comprised primarily of non-native species) and hayfields.

Dakota skipper

Approximately 375 acres (1 percent of the proposed Project Area) were classified as Excellent/Likely Dakota skipper habitat, and approximately 3,060 acres (10 percent of proposed Project Area) were classified as Good/Possible Dakota skipper habitat (Table 7, Figure 7a).

Twenty polygons, totaling approximately 728 acres (two percent of the proposed Project Area), were determined to consist of Poor/Unlikely habitat for Dakota skipper. Twenty-two polygons, totaling approximately 1,931 acres (6 percent of the proposed Project Area), were not visible during field verification surveys, or could not be classified during the desktop habitat assessment of the expanded portions of the proposed Project Area.

Potential Dakota skipper habitat within the Project Area is primarily located on hills, and most closely resembles the Type B habitat described by the USFWS, which is habitat occurring primarily on rolling grassland over gravelly glacial moraine deposits that is dominated by native prairie species such as little bluestem grass, purple coneflower, upright prairie coneflower, and common gaillardia (USFWS 2015a).

5.2 Bird Status Assessment

The following surveys were conducted to assess bird presence and use of the Project Area.

5.2.1 Survey Methods

5.2.1.1 Avian Point-Count Surveys

During fall 2015 and spring 2016, an experienced avian biologist conducted morning point-count surveys at locations within the Project Area to evaluate avian use, flight behavior, and species composition (Figure 8, Tetra Tech 2015c). The biologist conducted surveys at 15 locations every week for 12 weeks in fall from August 20 – November 4, 2015, for a total of 180 surveys. In spring, the biologist conducted surveys at 18 locations from March 18 – June 8, 2016, for a total of 234 surveys. Tetra Tech distributed the survey locations throughout the Project Area and chose locations that maximized the 360-degree sight distance for the observer and covered a diversity of habitats and topography. Surveys at each point lasted for 20 minutes, during which time biologists continuously recorded any visual or auditory observations. The biologist recorded data including: species, number of individuals, time of observation, height above ground, and behavior. The biologist estimated flight heights and distances using existing reference points

such as meteorological towers, transmission lines, oil and gas wells, roads, and buildings. For flocks of birds (i.e., greater than one individual) the height and distance was estimated at the center of the flock. Flight direction was recorded for individuals making directional flights, but was not recorded for individuals making localized movements. The order in which avian observation points were surveyed was varied, so that roughly equal numbers of surveys at each point were conducted during the morning and afternoon.

5.2.1.2 Eagle Use Surveys

In August 2015, 13 observation points, each with an 800-meter-radius, were established within the original proposed Project layout and boundary (dated May 21, 2015). These observation points provided spatial coverage of approximately 28 percent of a 1-kilometer buffer around the proposed turbine locations, consistent with recommendations in the ECP Guidance (USFWS 2013a). However, subsequent changes to the proposed turbine array after the point-count locations were established reduced spatial coverage to approximately 17 percent of the 1-kilometer buffer around the proposed turbine locations (dated November 6, 2015). Therefore, in January 2016, three of the original point-count locations with poor coverage of the turbine buffer were removed and eight additional point-count locations were established within the Project Area, resulting in a total of 18 point-count locations and spatial coverage of approximately 30 percent of the 1-kilometer buffer around turbine locations (Figure 8).

Eagle use surveys were conducted over 2-3 days every two weeks from August 20, 2015 to June 8, 2016 for a total of 22 rounds of surveys. From August 20 to October 27, 2015 and from March 21 to June 8, 2016, general avian point counts were conducted consecutively with eagle use surveys at each point-count location. All birds, including eagles, were recorded during the general avian point-count surveys, whereas only eagles were recorded during the eagle use surveys. Eagles were tracked on separate data sheets from other species during all surveys to facilitate analysis. Each general avian point count lasted 20 minutes, and was followed by an eagle use survey lasting an additional 60 minutes, for a total of 80 monitoring minutes per location. The fall avian surveys ended on November 4, 2015, and from November 8, 2015 to January 30, 2016, eagle use surveys were conducted exclusively at each point-count location, for a total of 60 monitoring minutes per visit. Surveys were conducted during daylight hours, and the order in which points were surveyed was altered between subsequent rounds so that each point was surveyed at different times of the day over the course of the season.

During each eagle use survey, the biologist continuously scanned the surrounding landscape for eagle activity using an unlimited viewshed. For each eagle observed, the biologist recorded the species, age class (Adult, Immature, or Unknown), time first and last observed, minimum and maximum flight heights, and flight behavior. Eagle flights were recorded in two height categories (less than or equal to 200 meters and greater than 200 meters above ground), based on the ECP Guidance. The time an observed eagle spent flying within the 800-meter-radius circular plot around the point-count location at each of these height categories was recorded and rounded up, in 1-minute intervals, so that these data could then be translated into eagle exposure minutes for projected fatality modeling. In accordance with the ECP Guidance, exposure minutes were defined as the number of minutes that an eagle was observed below

200 meters within the 800-meter-radius circular plot. Flight paths were drawn for each eagle within the viewshed on a topographic map of the Project Area, and later digitized using GIS software.

5.2.1.3 Summer and Fall 2015 Raptor Nest Surveys

Tetra Tech conducted raptor nest surveys with the primary objective of documenting the presence of nests of bald and golden eagles and other large raptors within the vicinity of the Project Area. Prior to conducting the survey, Tetra Tech requested the locations of known eagle nests within 10 miles of the Project Area from NDGF. An initial ground-based survey was conducted on June 10-11, 2015. The survey was conducted from public roadways by a local field biologist equipped with a spotting scope. The primary objective was to locate any nesting raptors within the Project Area plus a 2-mile radius around the Project Area.

A follow up aerial raptor nest survey was conducted on November 17 – 18, 2015, during the non-breeding season, after trees had dropped their leaves to increase visibility of raptor nests. The primary objective of this survey was to inventory all large nests that might have an effect on turbine micrositing. The aerial survey consisted of searches of suitable habitat for all raptors within the Project Area plus a 2-mile buffer. The aerial survey was conducted from a Bell-206 Jet Ranger helicopter (Double M Helicopters, Mandan, North Dakota) that was flown approximately 200 feet above ground level at an approximate speed of 60 miles per hour. The crew consisted of a Tetra Tech biologist, a local field biologist, and pilot. Surveyors primarily focused on potentially suitable nesting habitat on buttes and any large trees sufficient to support nesting by large raptors.

5.2.1.4 Winter 2016 Raptor Nest Surveys

January 2016. In order to detect any early-season occupancy of eagle territories, Tetra Tech conducted an aerial raptor nest survey on January 25 – 27, 2016, as recommended by USFWS. The aerial survey consisted of searches for all raptor nests within the Project Area plus a 2-mile buffer and searches for eagle nests only in the remainder of a 10-mile radius around the Project Area. Surveyors also checked the status of previously documented raptor nests, including all known nests within 2 miles of the Project and known bald and golden eagle nests and large stick nests within 10 miles of the Project Area. Data collected within the Project Area plus two mile buffer included location and status of all stick nests (occupied or unoccupied) and any observations of eagles. Data collected within the remainder of the 10-mile buffer around the Project Area included location and status of any eagle nests, potential eagle nests, and any observations of eagles. All suitable nesting habitat within 10 miles of the Project Area was searched for eagle nests during this survey.

February 2016. A second winter raptor nest survey was conducted on February 24, 2016, with the primary objective of checking the status of known and potential (large unconfirmed stick nests) eagle nests within 10 miles of the Project Area. All eagle nests and large stick nests documented during the January 2016 raptor nest survey were visited via helicopter so that their occupancy status could be checked.

5.2.1.5 Spring 2016 Raptor Nest Surveys

March 2016. Tetra Tech conducted an aerial raptor nest survey on March 29-30, 2016, as recommended by USFWS. The aerial survey was conducted from a Bell-206 Jet Ranger helicopter (Double M Helicopters, Mandan, North Dakota) that was flown approximately 200 feet above ground level at an approximate speed of 60 miles per hour (Tetra Tech 2016d). The crew consisted of a Tetra Tech biologist, a local field biologist, and pilot. Surveyors primarily focused on potentially suitable nesting habitat on buttes and any large trees sufficient to support nesting by large raptors. The aerial survey consisted of searches for all raptor nests within the Project Area plus a 2-mile buffer and searches for eagle nests only in the remainder of a 10-mile radius around the Project Area (Tetra Tech 2016d). Surveyors also checked the status of previously documented raptor nests, including all known nests within 2 miles of the Project and known bald and golden eagle nests and large stick nests within 10 miles of the Project Area. Data collected within the Project Area plus 2-mile buffer included location and status of all stick nests (occupied or unoccupied) and any observations of eagles. Data collected within the remainder of the 10-mile buffer around the Project Area included location and status of any eagle nests, potential eagle nests, and any observations of eagles (Tetra Tech 2016b). All suitable nesting habitat within 10 miles of the Project Area was searched for eagle nests during this survey. A follow-up ground nest survey was conducted in May 15-16, 2016 and followed the same methods as the summer and fall 2015 ground-based raptor nest surveys.

5.2.1.6 Eagle Nest Monitoring

Tetra Tech monitored several known and potential eagle nests to assess territory occupancy, nest activity, and to collect flight path directions and heights of eagles and to identify areas of use within 2-4 miles of the Project Area during the nesting season. The monitored nests included 1) an occupied bald eagle nest (Nest 2015_20), 2) an occupied golden eagle nest (Nest 2015_39), and 3) a cluster of several potential golden eagle nests (Nests 2015_11, 2015_12, 2015_13, 2015_14, and 2015_15; Figure 9a). The occupied bald eagle nest is approximately 3.0 miles to the east of the Project and was located during the spring 2015 aerial raptor nest surveys conducted in support of another proposed wind energy facility (now canceled). The occupied bald eagle nest was monitored for four hours once every two weeks from mid-January to mid-May 2016. The occupied golden eagle nest is located approximately 2.2 miles to the south of the Project and was confirmed to be occupied by golden eagles during the March 29-31, 2016 aerial raptor nest surveys. The occupied golden eagle nest was initially monitored on April 11 and 12, 2016 to gather baseline information and then daily from April 28 to May 16, 2016. The nest was typically monitored for 8 hours per nest watch, but hours spent nest monitoring ranged from 1 - 8.5 hours/day. The potential golden eagle nests consisted of a group of five large stick nests located on sandstone buttes, 2.1 to 3.2 miles to the northwest of the Project Area. These nests were found during the fall 2015 aerial nest inventory. These nests were monitored for 2-4 hours once every two weeks from mid-February to mid-May 2016.

5.2.1.7 Grouse Lek Surveys

The objective of the grouse lek surveys was to document all sharp-tailed grouse leks within the Project Area and 1-mile buffer (Tetra Tech 2016d). Tetra Tech protocols for the grouse lek surveys were designed to be responsive to the level of effort recommended in Tier 3 of the WEG (USFWS 2012a). Tetra Tech requested the location of any known sharp-tailed grouse leks from the NDGF on January 11, 2016. NDGF responded on February 3, 2016 stating that there were no documented leks in the Project Area or vicinity, but noted that the area had not been surveyed by NDGF (Pers. comm. A. Robinson NDGF; Appendix A; Tetra Tech 2016d). Prior to the field surveys, Tetra Tech prepared a desktop habitat assessment using the National Land Cover Database and aerial imagery. Open areas with grassland habitat were classified as suitable lek habitat. The initial survey route was developed with listening stations mapped 1 mile apart along accessible public roads adjacent to suitable habitat; however, per the request of NDGF, the spacing of the listening stations was reduced to 0.5 miles apart shortly before the surveys began (A. Robinson per com, Tetra Tech 2016e). The habitat suitability and access to the additional listening stations was verified by the field biologist during the first day of the lek surveys.

Two rounds of surveys were conducted between April 6 and 12, 2016 and between April 25 and 29, 2016. Of the 131 listening stations identified during the desktop analysis, 106 were accessible by public roads, occurred in suitable habitat, and were surveyed. Surveys were conducted from one-half hour before sunrise to two hours after sunrise to coincide with peak lekking activity (Tetra Tech 2016e). During the surveys, observers stopped at listening stations located 0.5-mile apart for a minimum of 3 minutes during which time the observer systematically scanned and listened for displaying sharp-tailed grouse. Observed leks were mapped and numbers of males and females were counted if possible. The lek surveys were not conducted when winds exceeded 20 miles per hour or if there was any type of precipitation event (Tetra Tech 2016e).

5.2.1.8 Eagle Prey Base Surveys

Tetra Tech conducted aerial surveys to identify any concentrations of prey that may serve as important eagle-use areas, as recommended by the ECP Guidance. Aerial surveys were performed from a fixed-wing aircraft twice each month in March and April 2016. North-south transects were flown at 1-mile intervals across the Project Area plus a 2-mile buffer, requiring approximately 220 flight miles (3 hours flight time) per survey. This approach is the same as that used by NDGF for state-wide ungulate population surveys, thereby facilitating acceptance of the results by the agencies. The survey crew consisted of a local biologist and the same pilot and aircraft used by the NDGF for its surveys. During the aerial survey, the biologist recorded numbers and locations of deer, pronghorns, lagomorphs, game birds, prairie dog colonies, carrion, and other possible food resources for eagles with a GPS-enabled tablet. All eagles observed during the surveys were also recorded.

Tetra Tech requested locations of prairie dog towns from NDGF within a 10-mile radius of the Project Area in January 2016. NDGF reported nine known prairie dog towns within 10 miles of

the Project Area. Two of these prairie dog towns are located within the eagle prey-base survey area (Project Area plus a 2-mile buffer); one is located in the northeastern portion of the Project Area, and the other is located 1.7 miles to the north of the Project Area (Figure 5).

Additionally, Tetra Tech used a helicopter to examine the known prairie dog colony locations provided by NDGF within 10 miles of the Project Area for occupancy and activity. Two visits were made during winter, coinciding with the January and February raptor nest surveys. During each visit, biologists observed the prairie dog towns from a helicopter hovering over the site and recorded signs of occupancy, including recently cleared burrows and pathways in the surrounding grass. Black-tailed prairie dogs do not hibernate, so such signs of occupancy can be visible from the air throughout the winter.

5.2.2 Bird Presence and Use Patterns

5.2.2.1 Species Presence by Season/Bird Use Patterns

Non-Raptors

During fall 2015 point counts, a total of 4,851 individuals from 34 bird species were observed within the Project Area. Overall mean bird use within the Project Area was 26.95 birds/20 minutes, and ranged from 0 to 440 birds/20 minutes. Non-raptor mean use was 25.88 birds/20 minutes. Songbirds had the highest mean use of all species groups observed (20.19 birds/20 minutes). The songbird species with the highest mean use were the red-winged blackbird, horned lark, and American crow (11.62, 1.62 and 1.48 birds/20 minutes, and observed in 22.8, 24.4 and 16.7 percent of all surveys, respectively). Overall, these three species accounted for 54.6 percent of all birds observed in the Project Area. Of the species with the highest mean use, the red-winged blackbird had the highest encounter rate (5.92 birds flying at the height of the rotor-swept area [RSA]/20 minutes) (Tetra Tech 2016a).

During spring 2016 point counts, a total of 4,937 individuals from 48 species were observed within the Project Area. Overall mean use within the Project Area was 21.10 birds/20 minutes, and ranged from 0 to 74 birds/20 minutes. Spring mean use by non-raptors was 20.54 birds/20 minutes. Songbirds had the highest mean use (16.26 birds/20 minutes) among species groups, followed by gamebirds (1.92 birds/20 minutes), and pigeons/doves (1.03 birds/20 minutes), The remaining non-raptor species groups (waterfowl, waterbirds, gulls/terns, woodpeckers, and cranes/rails) each had mean use values of 0.75 birds/20 minutes or less. The songbird species with the highest mean use was the red-winged blackbird (3.56 birds/20 minutes), followed by American robin (2.90 birds/20 minutes), horned lark (2.13 birds/20 minutes), brown-headed cowbird (2.12 birds/20 minutes), and western meadowlark (1.49 birds/20 minutes). These five species accounted for 57.8 percent of all bird observations during the spring survey. The remaining songbird species observed had mean use values of 0.98 birds/20 minutes or less. All species had encounter rates less than 1.00 birds flying at RSA height/20 minutes. Canada goose had the highest encounter rate (0.16 birds flying at RSA height/20 minutes).

Non-Eagle Raptors

In fall 2015, six raptor species were observed and raptor mean use was 1.07 birds/20 minutes. Swainson's hawk and northern harrier had the highest mean use among raptors (0.26 birds/20 minutes) followed by red-tailed hawk (0.23 birds/20 minutes) and were observed in 24.4, 24.4 and 22.2 percent of all surveys, respectively. Other raptor species detected were the turkey vulture, American kestrel, and ferruginous hawk, each with mean use values less than 0.22 birds/20 minutes and observed in less than 11.0 percent of all surveys. Of raptor individuals observed flying, 49.7 percent flew below the height of the anticipated RSA and 50.3 percent flew at the height of the anticipated RSA. Turkey vulture, red-tailed hawk, and Swainson's had encounter rates of 0.21, 0.16, 0.15 birds within the RSA/20 minutes, respectively. No federally listed species were observed during surveys, but three state-listed and one BCC raptor species were observed during fall 2015 surveys (Table 5).

In spring 2016, six raptor species were observed and raptor mean use was 0.56 birds/20 minutes. The raptor species with the highest mean use was northern harrier (0.20 birds/20 minutes; observed in 19.2 percent of all surveys) and Swainson's hawk (0.14 birds/20 minutes; observed in 13.7 percent of all surveys). Other raptor species detected included turkey vulture, American kestrel, red-tailed hawk, and merlin, each with mean use values less than or equal to 0.10 birds/20 minutes and observed in less than 2.7 percent of all surveys. Of raptor individuals observed flying, 71.2 percent flew below the height of the anticipated RSA and 28.8 percent flew at the height of the anticipated RSA. None of the raptors were observed flying above the anticipated RSA height. No federally or state-listed species were observed during spring surveys, but three state-listed and one BCC raptor species were observed (Table 5).

Eagles

A total of 21 eagle exposure minutes were accrued during 403 hours of monitoring during the general avian point counts and eagle use surveys. Overall mean use, calculated as the total number of exposure minutes divided by the total number of observation hours, was 0.052 bald eagles per hour. Two bald eagles were observed within the 800-meter-radius circular plots. The first bald eagle accrued 13 exposure minutes while flying between 3 and 10 meters above ground near Point 9 on March 22, 2016. This immature eagle flew in from the west, briefly perched on several utility poles, and then flew off towards the east before veering to the south. The second eagle accrued eight exposure minutes while flying between 30 and 48 meters above ground near Point 11 on April 8, 2016. This adult eagle was observed flying from north to south, below 200 meters and within the 800-meter survey radius for the entirety of the observation. No golden eagles were observed within the 800-meter-radius circular plots during the general avian point counts and eagle use surveys.

Incidental Eagle Observations

Five golden eagles and two bald eagles were observed incidentally within the Project or surrounding area. One of the golden eagles and one of the bald eagles were observed during the eagle use surveys but beyond 800-meter radius circular plots. Flight paths of these two eagles were collected, although these observations accrued no exposure minutes following the

ECP Guidance. An adult golden eagle was observed flying to the north between 30 and 80 meters above ground near Point 18 on January 29, 2016. An adult bald eagle was observed flying south between 100 and 150 meters above ground near Point 17 on February 24, 2016.

Four golden eagles and one bald eagle were observed in transit between survey points. The location of these observations were noted but no flight paths were collected due to safety of the observers while driving. The first golden eagle was observed perched in a tree, before being flushed and flying away to the south at a flight height between 10 and 50 meters above ground level south of Survey Point 4 on August 19, 2015. The second golden eagle was observed on December 4, 2015, perching on a large butte in proximity to a group of five large, unoccupied stick nests outside of and to the northwest of the Project Area. These are the same nests that were located during an aerial raptor nest inventory conducted in November 2015 (Tetra Tech 2016a). The third golden eagle was observed on January 3, 2016, perched on a utility pole, approximately 4 meters above the ground, near Survey Point 20. The fourth golden eagle was observed on January 15, 2016; the eagle was observed flying to the west at a flight height between 50 and 70 meters above ground level, to the north of the Project Area. The bald eagle was observed in flight between 50 and 80 meters above ground level, near Survey Point 5 on September 30, 2015.

Two eagles were observed incidentally to the prey-base surveys; one golden eagle was observed in the center of the Project Area on March 10 and one bald eagle was observed approximately 1-mile to the southwest of the Project Area on March 24, 2016.

Non-Eagle Raptor Nests

Raptor nests detected in fall 2015 within the Project Area included five occupied Swainson's hawk nests, one occupied red-tailed hawk nest, and six small unoccupied nests (Figure 9a and 9b). Outside of the Project Area, surveyors located two occupied Swainson's hawk nests, two occupied red-tailed hawk nests, six large unoccupied nests, and 13 small unoccupied nests. The six large unoccupied nests were located on the ledges of sandstone buttes and were comprised of two groups; a cluster of five nests and a single nest. These large nests are most likely to be used by large raptor species such as golden eagles or ferruginous hawks, and a golden eagle was subsequently viewed perching in proximity to the cluster of five large unoccupied nests. The small inactive nests were all located in trees and are most likely used by smaller raptor species found within the Project Area (e.g., red-tailed hawk and Swainson's hawk).

During the January 2016 raptor nest surveys, 17 unoccupied small stick nests of unknown species were found within two miles of the Project Area; eight within the Project Area and 12 between the Project boundary and the two mile buffer. Five of these nests were newly documented. Small stick nests were not checked during the February 2016 survey because the goal of that survey was to detect any early-season occupancy of eagle territories only.

Surveyors located six unoccupied small stick nests within the Project Area during the March 2016 aerial raptor nest surveys. Outside the Project Area, but within the 2-mile buffer, surveyors located six occupied great horned owl nests, one occupied red-tailed hawk nest, and three

unoccupied small stick nests. All of the unoccupied small stick nests were located in trees and are most likely used by smaller raptor species (e.g., red-tailed hawk and great horned owl). During the March 2016 surveys, two of the small stick nests located within 2 miles of the Project Area that were present in January 2016 were determined to have been destroyed by the wind.

Follow-up ground surveys conducted in May 2016 located one occupied red-tailed hawk and one occupied Swainson's hawk nest in the Project Area along with four unoccupied small stick nests. Twelve occupied nests were found outside of the Project Area but within the 2-mile buffer along with seven unoccupied small stick nests. One Swainson's hawk, one great-horned owl, and two red-tailed hawk nests were active at the time of construction and therefore a non-disturbance buffer was established around each nest to minimize impacts from construction activities (Figure 11).

Eagle Nests

Fall 2015. NDGF provided locations of six known golden eagle nests within 10 miles of the proposed Project Area (Figure 3). The nests are located on large sandstone bluffs and are approximately 8 to 9 miles to the northwest of the Project Area, possibly indicating one to two territories based on spacing of the nests. No golden eagle nests or cliff faces with suitable nesting ledges were found within the Project Area or two mile buffer surrounding the Project Area during an aerial nest inventory conducted in November 2015. There were two groups of unoccupied large stick nests located during the fall 2015 aerial nest inventory; a cluster of five nests 2.1 to 3.2 miles from the Project Area and a single nest 5.9 miles from the Project Area (Figure 10). All six of these unoccupied large stick nests were located on sandstone buttes and the nest spacing indicates that there may be one to two raptor territories. These large nests are most likely to be used by large raptor species such as golden eagles or ferruginous hawks, and a golden eagle was subsequently viewed perching in proximity to the cluster of five large unoccupied nests in December 2015. Twice monthly surveys began in January 2016 to determine whether these large nests are occupied by golden eagles.

January 2016. During the January raptor nest surveys, no bald or golden eagle nests were found within the Project Area or two mile buffer surrounding the Project Area. Beyond the two mile buffer around the Project Area, three of the golden eagle nests reported by NDGF were unoccupied in January 2016 (Tetra Tech 2016b). These included one that was reported by NDGF as destroyed but surveyors observed a nest in poor condition at the location. Three of the golden eagle nests reported by NDGF were not located (one of which was reported as destroyed in the dataset provided by NDGF). The two groups of large stick nests located on buttes between 2.1 and 5.9 miles from the Project Area were all unoccupied. The two known bald eagle nests located by Tetra Tech in 2015 were both occupied in January 2016 (Figure 10).

Five new large stick nests were found within 10 miles of the Project Area; all five were unoccupied. One nest was located on a sandstone pillar in proximity to the golden eagle nests reported by NDGF, approximately nine miles to the northwest of the Project Area. The other four

large stick nests were located in deciduous trees between three and 10 miles from the Project Area.

February 2016. The two known bald eagle nests that were occupied in January 2016 were still occupied during the February surveys. An adult bald eagle was incubating at Nest 2015_19. And an adult was perched nearby at Nest 2015_20. All of the known and potential golden eagle nests located on sandstone buttes to the northwest of the Project were unoccupied.

Two of the three of the large stick nests located in trees to the south of the project (Nest 2016_08 and Nest 2016_09 were occupied in February 2016, based on the addition of fresh greenery (added since the January surveys); however, no eagles were observed in attendance at these nests. Three additional large stick nests (Nests 2016_11, 2016_12, and 2016_13) were found in close proximity (less than 25 meters) to documented nests, and were likely alternate nests within an eagle territory. Three eagles (one bald and two golden eagles) were observed incidentally during the survey. All of the eagles were observed flying individually and at least 0.36 miles from the nearest known large stick nest.

March 2016. No occupied eagle nests were located within the Project Area or within the 2-mile buffer around the Project Area. Three occupied golden eagle nests and two occupied bald eagle nests were found between the 2-mile and 10-mile buffer around the Project Area (Table 8). The nearest nest is a golden eagle nest (Nest 2015_39), located 2.2 miles to the south of the Project Area. This nest is relatively undersized and located near the top of the tree. Surveyors classified this nest as small, and did not consider the nest to be a potential eagle nest when first located during the November 2015 surveys. The nest size and location is more typical of a medium to fairly large hawk nest than a typical golden eagle nest. Follow-up ground surveys were conducted in April and May and concluded that nest 2015_39 had at least one chick hatch but the nest partly fell apart and was abandoned around May 15 without successfully fledging chicks. USFWS and NDGF were notified of the nest failure on May 17, 2016 (Table 1).

None of the nests in the vicinity of the golden eagle nest locations provided by NDGF were occupied by golden eagles. Two occupied ferruginous hawk nests were located among these nests; one of the nests (Nest 2015_25) is located in a historical golden eagle nest, the other (Nest_2016_17) which was found in January, is located on top of a sandstone pillar.

Two of the large stick nests located on buttes between 2.1 and 5.9 miles northwest from the Project Area (Nest 2015_13 and Nest 2015_15) were determined to be occupied based on fresh lining material added to the nests between the February and March surveys. However, no raptors were present and the species could not be determined.

Tetra Tech analyzed the mean inter-nest distance separately for bald eagle nests and golden eagle nests within the Project Area and surrounding 10-mile survey buffer. Two criteria were used to include nests within the analysis for each eagle species: 1) known nests of a given eagle species, and 2) known nests of a given eagle species and all large stick nests that were consistent with the species. For both species active, inactive, and unoccupied nests were included in the analysis. The bald eagle mean inter-nest distance was 8 miles for known bald eagle nests, but was reduced to 3 miles when large stick nests were included (Table 9). The

golden eagle mean inter-nest distance for known golden eagle nests was 0.8 miles, but increased to 3 miles when large stick nests were included (Table 9).

Eagle Prey Base Surveys

In January 2016, one prairie dog town, six miles west of the Project Area was confirmed to be occupied; the remaining known prairie dog towns did not appear occupied in January 2016. Prairie dog activity, based on the presence of individuals, was confirmed at 11 known prairie dog towns within 10 miles of the Project in March 2016. All of the prairie dog towns appeared to be occupied based on the presence of freshly excavated burrows and trails of worn-down vegetation between burrow entrances. Only one occupied prairie dog town was observed within the Project Area (Figure 5).

Herds of pronghorns and deer (both mule deer and whitetail deer) were observed throughout the survey area during the eagle prey-base surveys. The number of pronghorns and deer observed during the surveys was similar with a total of 104 and 97 individuals observed during the four rounds of surveys, respectively. The number of individuals per herd ranged from 1-14 pronghorns and 3-13 deer. Within the Project Area, most of the prey species were observed on the east side of the Project Area with zero pronghorn and 18 deer on the west side versus 36 pronghorns and 32 deer on the east side. The total number of prey species was highest during the first survey on March 10, and decreased with each subsequent survey. The biologist did not observe any prairie dog towns beyond those already identified in the NDFG data, nor did he observe lagomorphs, game birds, or carrion from wildlife or livestock during the prey-based surveys.

Sharp-tailed Grouse

No leks were known to NDGF to occur within the Project Area; however, six sharp-tailed grouse leks were documented during the surveys; four of the leks within the Project Area and two leks were outside the Project Area but within 1-mile). The number of grouse observed at each lek ranged from 5 to 26 individuals. A total of 147 birds (93 males, 29 females, 23 unknown) were recorded at these leks, although this is a minimum count as not all birds were visible from the road.

Species of Concern

No federally listed threatened or endangered species were observed during avian point-count surveys, raptor nest surveys, or as incidental observations. Observations of eagles, BCC species, state species of conservation priority, and species of fragmentation concern by season are summarized in Table 10. Species of concern with the potential to occur within the Project Area are discussed below.

Whooping Crane (Federally Endangered)

The only self-sustaining population of whooping cranes breeds in Wood Buffalo National Park in Canada and winters along the Gulf of Mexico at Aransas NWR in Texas (Austin and Richert

2001). Spring migration occurs primarily in April and May and fall migration occurs primarily in October and November (Austin and Richert 2001). Stopover habitat during migration includes a variety of croplands with roosting occurring in shallow, freshwater inland wetlands (Austin and Richert 2001). Four areas associated with major stopover areas are designated as critical habitat: Quivira National Wildlife Refuge and Cheyenne Bottoms State Wildlife Management Area in Kansas; a section of the Platte River in Nebraska; and the Salt Plains National Wildlife Refuge in Oklahoma (USFWS 2009). Wind energy development has been identified as a threat to the species due to the potential for displacement due to the presence of the turbines, and potential for collisions with operational wind turbines and new power lines (USFWS 2009). Collisions with power lines contribute substantially to whooping crane mortality during migration are considered the primary risk to cranes during migration (USFWS 2009). Collisions with wind turbines is of lower risk because turbines are more visible than power lines; no whooping cranes and only two sandhill cranes (a related species) have been reported as wind turbine-related fatalities in publicly available literature (Stehn 2011).

Tetra Tech conducted a whooping crane likelihood assessment in which wetlands within the proposed Project Area and surrounding 35-mile buffer around the Project boundary were evaluated for suitable wetland habitat for whooping cranes (Tetra Tech 2015b). Palustrine wetlands (freshwater wetlands characterized by emergent vegetation, e.g., playas) are most often used as roosting sites, but individuals have been found roosting at lacustrine wetlands (wetlands around a lake), and riverine wetlands (wetlands along a river; Austin and Richert 2001). The NLCD indicates less than one percent of the Project Area is wetland habitat (Table 2; Figure 4).

In addition to wetlands, another indicator of potential occurrence by whooping cranes during migration is the presence of cultivated croplands. Austin and Richert (2001) found that cultivated croplands, such as wheat, were most often utilized by migrating whooping cranes if in close proximity to wetlands. Seventy-eight percent of the Project Area consists of suitable wetland-agriculture matrix habitat (Tetra Tech 2015b).

Based on the whooping crane likelihood assessment (Tetra Tech 2015b) the likelihood of whooping cranes occurring within the Project Area is low. The majority of whooping crane sightings (90 percent) occurred closer to the center of the migration corridor and farther away from the Project Area. Furthermore, the wetland habitat within the Project Area is slightly lower than the surrounding 35-mile buffer area, which may make the Project Area less attractive to migratory whooping cranes when compared to the surrounding area. In addition, the Project Area does not occur near whooping crane critical habitat (USFWS 2014a); the closest critical habitat is in the designated section of the Platte River in Nebraska, which is located over 708 kilometers (440 miles) to the south-southeast.

Sharp-tailed Grouse (ND Species of Conservation Priority, Level II)

Although sharp-tailed grouse are afforded no special federal regulatory protection, the species is a Level II state-listed species of Conservation Priority (Section 2.4). Current research suggests that certain grouse species may avoid anthropogenic structures (USFWS 2012a;

Hagen et al. 2011); however, long-term data sets are still needed to assess wind energy impacts (Johnson et al. 2012). Regardless, state and federal wildlife agencies have regularly expressed concern about the locations of wind turbines with respect to grouse leks. Leks are breeding grounds where grouse congregate and males engage in communal breeding displays during the spring (March –April; Connelly et al. 1998).

Sharp-tailed grouse prefer areas dominated by relatively dense herbaceous cover and shrubs. Common grasses include bluestems (*Andropogen* spp.), bluegrasses (*Poa* spp.), wheatgrasses (*Agropyron* spp.), and needlegrasses (*Stipa* spp.); common shrubs include rose (Rosa spp.), cherry (*Prunus* spp.), serviceberry (*Amalanchier* spp.), snowberry (*Symphoricarpos* spp.), sagebrush (Artemisia spp.), and hawthorn (*Crataegus* spp.) (Connelly et al. 1998). Leks form the hub of breeding habitat and usually occur on elevated areas. Leks sometimes are associated with disturbed sites and often on sites with less vegetation than surrounding areas. Lek locations are generally stable from year to year, although location may change, especially if area is covered with snow or water (Connelly et al. 1998). Nesting habitat includes stands of grasses, shrubs, and forbs. The species may nest in alfalfa (*Medicago sativa*) and wheat (*Triticum aestivum*) stubble, but usually nests in relatively heavy cover, often under a shrub in vegetation at least 30 centimeters (cm) high with dense foliage (Connelly et al. 1998). Sharp-tailed grouse may remain in summer habitat until snowfall forces individuals to winter range. Winter habitat requirements are narrower than in other seasons, when the species often relies on riparian areas, deciduous shrub draws, and open coniferous woods (Connelly et al. 1998). During mild winters, the species may use grain fields and Conservation Reserve Program (CRP) fields (Connelly et al. 1998). Sharp-tailed grouse were observed during fall point-count surveys within the Project Area. To obtain a better understanding of lek locations, lek data were requested from NDGF and focused lek surveys are scheduled for spring 2016. On February 26, 2016, NDGF indicated that they have not performed lek surveys in the vicinity of the Project Area, and therefore do not have any records of grouse leks there (A Robinson, NDGF, pers. comm.). Our spring 2016 surveys located six leks in the Project Area or within 1-mile of the Project Area.

Bald Eagle (Federally Protected Under BGEPA)

Bald eagles occur throughout the contiguous United States, Alaska, and Canada (Buehler 2000). Individuals may occur as breeders, winter residents, migrants or year-round residents (Buehler 2000). Bald eagles can nest in large trees or cliffs. The nesting period in North Dakota begins with nest building or maintenance in January and ends when the young fledge, typically in July (Tetra Tech, pers. obs.; Johnson 2010). Nests are relatively close to water, typically less than 2 miles. Although bald eagle nests have historically been found primarily along the Missouri River and Red River (Johnson 2010), the number of bald eagle nests has increased in North Dakota over the last 20 years as the species continues to recover from population declines, primarily due to environmental contaminants. Nesting bald eagles now occur in more than half of the counties in the state (Dyke et al. 2015) growing steadily to 140–150 active bald eagle nests to date (Johnson 2015). Most of the nests occur near streams and mid- to large-sized lakes, but bald eagles are also initiating nests in areas not considered traditional nesting

habitat such as cottonwood trees surrounded by cropland or grassland (Dyke et al. 2015). The home range of bald eagles is variable. Populations in Oregon and Washington have home ranges of 2.7 to 18.1 square miles, with an average of 8.5 square miles (Watson et al. 1991), and in Montana the average home range size was 3.5 square miles (Stangl 1994). Along the Mississippi River in Minnesota, nests were located an average of 0.94 mile from the nearest neighboring nest (Mundahl et al. 2013).

During the non-breeding season (September through January; USFWS 2013a), bald eagles concentrate near large bodies of water where the water remains unfrozen, and roost up to 20 miles from foraging sites, depending on abundance of prey (Buehler 2000). Bald eagles are opportunistic foragers that prey primarily on fish but also feed on other aquatic and terrestrial vertebrates, as well as on carrion (Buehler 2000).

Although the landscape within the Project Area does not support any large waterbodies or an abundance of smaller waterbodies that would attract bald eagles for nesting or foraging, the presence of occupied bald eagle nests in the vicinity of the Project Area (3 and 8.5 miles away) suggests that the species may hunt or pass through the Project Area during the breeding season. Based on the presence of bald eagle nests in the vicinity and bald eagle sightings within the Project Area and surrounding area, there is a high likelihood of bald eagle occurrence. Eagle use surveys are underway to evaluate risk of Project activities to eagles, and the lack of observations during these systematic surveys suggest that use of the Project Area by the species is low.

Golden Eagle (Federally Protected Under BGEPA)

Golden eagles are common in western North America west of the 100th meridian with small populations also present in the eastern portions of Canada and the United States (Kochert et al. 2002). Western golden eagle populations may be migratory or year-round residents; individuals from northern populations typically migrate south to over-winter in the southern region of the United States where eagle populations tend to be residential (Kochert et al. 2002). Both year-round and migratory golden eagles occur in North Dakota (NDFG 2015). Golden eagles in the western United States are most commonly associated with open and semi-open habitats such as shrublands, grasslands, woodland-brushlands, and coniferous forests as well as in farmland and riparian habitats (Kochert et al. 2002). Golden eagles nests on cliffs, utility poles, or in large trees and breeding areas vary by region, but are generally associated with mountainous canyon land, rimrock terrain of open desert, grassland areas, riparian habitats, and occasionally in forested areas (Kochert et al. 2002). Golden eagles in North Dakota nest mainly west of the Missouri River (Johnson 2015) and egg-laying occurs from late March to early May (Stewart 1975; DeLong 2004). The species feeds upon a wide variety of prey species but tends to hunt small to medium-sized mammals such as hares, rabbits, ground squirrels, marmots, and prairie dogs depending upon local availability (Bloom and Hawks 1982; Kochert et al. 2002).

The presence of three occupied golden eagle nests outside of but within 10 miles of the Project Area suggests that the species may hunt or pass through the Project Area during the breeding season. Eagles use surveys were conducted to evaluate risk of Project activities to eagles, and

the low mean use and number of exposure minutes for bald and golden eagles during the eagle use surveys suggest that use of the Project Area by these species is low. Although golden eagles have a low likelihood of breeding within the Project Area due to a lack of suitable nesting habitat, the species may hunt or pass through the Project Area during any time of the year. Possible food resources for golden eagles within the Project Area include both carrion and live prey. Potential sources of carrion include wildlife from road kill, powerline collision, natural death and predation, and hunting. Domestic animals, particularly livestock could also be available as road kill or cattle left or placed in private fields. Live prey include small and medium sized mammals, particularly prairie dogs, lagomorphs and larger mammals such as deer and antelope. Game birds such as pheasant and sharp-tailed grouse could also be prey for golden eagles. However, there are no known features that would concentrate golden eagles within the Project Area compared to the surrounding area (e.g., the number and density of prairie dog towns outside the project is greater than the award). The presence of suitable foraging habitat and incidental sightings within the Project Area and surrounding area suggest that there is a high likelihood of golden eagle occurrence, although the lack of observations during systematic eagle use surveys suggest that use of the Project Area by the species is low.

5.2.2.2 Species of Habitat Fragmentation Concern

Two species of habitat fragmentation concern (USFWS 2013b) were observed during surveys within the Project Area: northern harrier and sharp-tailed grouse (Table 10). A total of 107 observations of northern harriers were made within the Project Area: 46 during fall avian point-count surveys, one incidentally to fall point-count surveys, four incidentally to fall and winter eagle use surveys, and 56 during spring point-count surveys. A total of 60 sharp-tailed grouse observations were made within the Project Area: 45 during fall point-count surveys, four incidentally to fall and winter eagle use surveys, two during spring eagle use surveys, and nine incidentally to spring eagle use surveys.

Although the Project Area is outside of the mapped range for greater sage grouse in North Dakota, it is possible that the greater sage grouse could occur (K. Shelley, USFWS, pers. comm. 2015). However, the greater sage grouse is a sagebrush obligate species, and there is no known sagebrush within or near the vicinity of the Project Area, making the likelihood of occurrence low. The Project Area is outside of NDGF's study area for greater sage grouse, so NDGF does not track leks within the Project Area (A. Robinson, NDGF, pers. comm. 2016). No greater sage grouse leks were observed during Project lek surveys.

5.3 Bat Status Assessment

5.3.1 Bat Habitat

Tetra Tech prepared a desktop assessment of bat likelihood of occurrence and conducted acoustic bat monitoring in the Project Area in the summer and fall of 2015. The objective of acoustic monitoring was to supplement and refine the desktop assessment, as well as to assess bat use and occurrence of the Project Area by local and migratory bat species. Tetra Tech

designed the acoustic monitoring surveys at the Project Area in accordance with the recommendations outlined in Tier 3 of the voluntary USFWS Land Based WEGs (USFWS 2012a) and the Northern Long-eared Bat Interim Conference and Planning Guidance for Phase 2 presence/absence surveys (USFWS 2015c).

5.3.2 Bat Survey Methods

Tetra Tech deployed four ground-based bat detectors within the Project Area on July 22, 2015, and they were continuously surveyed until December 3, 2015. This timing was selected to sample the summer volancy period (when pups can fly, approximately three weeks after birth) and the complete fall migration periods for the majority of North American bat species, including NLEB. Sampling sites were chosen within areas with that had the highest potential for high bat activity and that were accessible under existing lease agreements (Figure 3). The microphone height of each of the ground-based bat detectors was approximately 2.5 meters above ground level. To ensure that the greatest period of bat activity was surveyed, bat detectors were programmed to begin recording at sunset and stop recording approximately at sunrise each day. Tetra Tech used Wildlife Acoustics Song Meter SM3 Monitoring Systems (bat detectors) for the duration of the acoustic monitoring survey. Each bat detector station consisted of the acoustic detector, powered by a 25 – 50 watt solar panel and a 12-volt DC battery, encased in a waterproof housing. The SM3-U1 microphone was attached to the recording unit by a high-quality, low-loss 3-meter microphone cable. Each bat detector was manually checked by trained technicians approximately twice per month during the survey period.

Definitive identification of bat species by echolocations was a two-step process, whereby data are first analyzed using automated bat call identification software approved by the USFWS and then manually reviewed to confirm species identification.

All recorded data files were filtered by software to identify data files containing potential bat calls[1]. Data were scrubbed and analyzed using Kaleidoscope Pro (Wildlife Acoustics, Inc.) version 3.1.5 and the classifier “Bats of North America 3.1.0” for species of bats in North Dakota. A sensitivity level of “-1 more sensitive/liberal” was used per Wildlife Acoustics and USFWS recommendations (USFWS 2015d). Signals of interest ranged from 8-120 kilohertz lasting 2 – 500 milliseconds with a minimum of two call pulses. Full spectrum .wav files were converted to zero-crossing using a division ratio of eight.

All calls classified as potential NLEB by the software were manually reviewed by Tetra Tech in full spectrum format using SonoBat 3.2.0 (SonoBat, Inc.) to confirm the automated classifications. During manual review, Tetra Tech considered a recording as suitable for species level identification if the individual call pulses within the call sequence exhibited the full spectrum of frequency modulation produced by a bat species. Calls that lacked detail to be identified at the species level (e.g., too far from the microphone or noise interference) were identified as “Myotis species” if the call pulses contained characteristics unique to Myotis (i.e., well defined

[1] Each recorded event including a bat vocalization consists of individual “call pulses” that comprise a “bat call sequence” or “bat pass.”

tones), or as “High frequency species” if the frequency center was greater 40 kilohertz and call characteristics between eastern red bat and Myotis were ambiguous. As part of a third party review process, Biodiversity Research Institute independently reviewed all calls classified as potential NLEB by the software.

5.3.3 Bat Presence and Use Patterns

5.3.3.1 Species Presence by Season/Bat Use Patterns

A total of 25,581 bat call sequences were recorded and identified to the species level, resulting in an overall activity rate of 47.4 bat calls/detector night (Tetra Tech 2016c). Bat call sequences identified at the species level included five species (Table 11). Little brown bat were the most commonly recorded species (86 percent of the total calls recorded), followed by eastern red bat (nine percent), silver-haired bat (three percent), big brown bat (one percent), and hoary bat (less than one percent). Following deployment on July 22, bat activity increased sharply at the start of August and remained steady throughout the month until an abrupt decline at the start of September. The highest levels of bat activity appeared to be concentrated near forested patches with open water sources nearby (Tetra Tech 2016c).

Bat call sequences identified at the species level included five species (Table 12). Little brown bats were the most commonly recorded species (86 percent of the total calls recorded), followed by eastern red bats (9 percent), silver-haired bats (3 percent), big brown bats (1 percent), and hoary bats (< 1 percent).

5.3.3.2 Species of Concern

Few data are available on NLEB in North Dakota; however, the species is believed to occur statewide in suitable habitats (Harvey et al. 2011; Gullickson n.d.). Surveys conducted in the summers of 2009, 2010, and 2011, confirmed the presence of NLEB in the Turtle Mountains (approximately 200 miles northeast of the Project), Missouri River Valley (approximately 50 miles northeast of the Project), and in the Badlands regions (approximately 200 miles south of the Project; Gilliam and Barnhart 2011). The species has recently been detected in Billings and Hettinger counties (Gilliam and Barnhart 2011; Western and USFWS 2015), and could occur in the Project Area during seasonal movements to and from hibernacula; however, no hibernacula are known to occur in the state. There is little suitable roosting or foraging habitat in the Project Area or within the Project Buffer for the NLEB. The small size and small number of wooded parcels in the Project Area and the Project Buffer likely limits the density and diversity of bats in the Project Area. Because of this lack of forested habitat within the Project Area and the location of the Project Area at the edge of the species’ range, NLEB have a low likelihood of occurring in the Project Area. There are no known NLEB hibernacula in North Dakota, and the NLEB is considered to be rare in the state (USFWS 2013c; Dyke 2014).

No NLEB were detected during the survey, but the Project Area is within the species’ presumed range and NLEB are known to occur in Stark County (USFWS 2015a), therefore occurrence is possible. The most likely period of potential risk to NLEB is during seasonal movements

between winter hibernacula and summer habitats; however, the locations of hibernacula in North Dakota are not known.

5.3.3.3 Species of Habitat Fragmentation Concern

There are no bat species on USFWS's list of species of habitat fragmentation concern (USFWS 2015a). However, the NLEB may be sensitive to habitat fragmentation due to its preference for large tracts of forested habitat. Large, contiguous tracks of upland forested habitat, preferred by NLEB, are not present in the Project Area. Only approximately one percent of the 23,983-acre Project Area is forested. Forested habitat in the Project Area (woody wetlands, evergreen forest, mixed forest, deciduous forest) is relegated to small woodlots that are disconnectedly distributed along riparian areas, as woody wetlands, and as windbreaks along fields or at homesteads. Therefore, due to the existing fragmented nature of the Project Area, habitat fragmentation is not a concern for NLEB within the Project Area.

5.4 Dakota Skipper Assessment

The Dakota skipper is a small butterfly found in the tallgrass and mixed-grass prairies of the Northern Great Plains. On October 24, 2014, the USFWS listed the Dakota skipper as a threatened species (USFWS 2014a). Although its historic range once consisted of vast, unbroken native prairie in the north-central United States and south-central Canada, its current range is now limited to scattered remnants of high quality native prairie in Minnesota, North Dakota, South Dakota, and southern Manitoba and Saskatchewan (USFWS 2015a). The Dakota skipper population has declined due to sensitivity to disturbances, such as grazing and fire, and the loss of native prairie habitat. The USFWS to designate 50 units, ranging in size from 31 acres to 2,887 acres, in North Dakota, Minnesota, and South Dakota as critical habitat (USFWS 2014b). The closest critical habitat to the Project Area is approximately 70 miles to the north in McKenzie County.

The Dakota skipper is not known to occur in Stark County (Western and USFWS 2015); however, Stark County is on the western extent of the species' range (USFWS 2015a), and as a result, there is a low likelihood for the species to occur within the Project Area. Brady Wind has evaluated potential habitat for the Dakota skipper within the Project Area and has identified approximately 375 acres (1 percent of the Project Area) as Excellent/Likely Dakota skipper habitat and approximately 3,060 acres (10 percent of Project Area) was classified as Good/Possible Dakota skipper habitat. Approximately 1,931 acres (6 percent of the Project Area) were classified as undetermined (i.e., could not be determined from desktop analysis or verified in the field due to access limitations).

6.0 POTENTIAL PROJECT IMPACTS

This section outlines potential risks to wildlife related to the construction and operation of the Project.

6.1 Project Risk Assessment

In the following sections, the field data collected in 2015-2016 were analyzed to assess potential Project impacts. Impacts to the species under discussion can be short-term (one or two reproductive seasons), or long-term (affecting several generations). They can be direct (an immediate effect to an individual, population or its habitat), or indirect (an effect that may occur over time or result from other actions). Direct impacts may include collisions with Project infrastructure such as turbine blades or transmission lines; electrocution; disturbance from construction or operations activities; displacement due to loss of suitable habitat; and habitat loss and fragmentation that creates a barrier to dispersal, regular movements, or migration. Indirect impacts may include loss or change of population vigor; attraction to modified habitats, and increased exposure to predation as a result of altered habitat use. Additionally, the Project may contribute to cumulative impacts that may affect certain species, in conjunction with impacts from other future development.

6.1.1 Avian Impacts

Songbirds, pigeons/doves, and gamebirds were the most commonly observed species groups during fall 2015 and spring 2016 avian point-count surveys and are likely to use the Project Area. The most commonly observed species during fall and spring were red-winged blackbird, brown-headed cowbird, mourning dove, ring-necked pheasant, horned lark, American crow, western meadowlark, and American robin.

6.1.1.1 Direct Impacts on Birds

General Avian Species

The avian community detected within the Project Area during avian surveys was characterized by species typical of agricultural lands and cattle pastures 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. Recent meta-analyses relevant to the Project have estimated an average all-bird (mostly small birds) fatality rate of 1.81 birds/MW/year in the Great Plains (Loss et al. 2013) and 2.29 small birds/MW/year in the Prairie biome (Erickson et al. 2014). Project-related bird fatalities may be reasonably expected to occur within the range defined by these studies.

Collision

Birds have been identified as a group at risk because of collisions with wind turbines and power lines (Erickson et al. 2005; Drewitt and Langston 2006; Arnett et al. 2007). Specifically, migrant passerines (e.g., songbirds) are found more often in post-construction mortality monitoring compared to other groups of birds (Arnett et al. 2007). In fact, at newer generation wind energy facilities outside of California, approximately 80 percent of documented mortalities have been songbirds, of which 50 percent are often nocturnal migrants (Erickson et al. 2001; Johnson et al. 2002; Drewitt and Langston 2006; Strickland and Morrison 2008).

Locally breeding songbirds may experience lower mortality rates than migrants because many of these species tend not to fly at turbine heights during the breeding season. However, some breeding songbird species have behaviors that increase the risk of collisions with turbines. For example, horned larks have been commonly found as fatalities at wind farms, and mortality may be partially attributed to the breeding flight displays within the rotor swept area (Pickwell 1931; Johnson and Erickson 2011). Most song birds are short-lived, have high reproductive output, and their population growth rates are more sensitive to reproductive failure than to adult survival (Stahl and Oli 2006; Arnold and Zink 2011). Additionally recent meta-analysis of wind-energy impacts concluded that collisions with wind turbines have negligible cumulative impacts on passerine (songbird) populations, with mortality rates due to these collisions ranging from 0.008 to 0.0043 percent of the continental population per year (Erickson et al. 2014). Therefore, collision mortality for most songbird species is expected to have negligible effects on population dynamics.

Four songbirds were identified as having potential risk of collision due to high encounter rates and/or relatively high mean use rates during fall avian point-count surveys: red-winged blackbird, horned lark, American crow, and western meadowlark. Encounter rate was highest for red-winged blackbirds (5.92 birds flying at RSA height/20 minutes). All other songbird species had encounter rates less than 0.79 birds flying at RSA height/20 minutes. The western meadowlark had a relatively high frequency of detection compared to the other species (observed in 35.0 percent of all surveys) but relatively low mean use (1.32 birds/20 minutes) and an encounter rate of 0.00 birds flying at RSA height/20 minutes. In spring, mean use was highest for the red-winged blackbird, American robin, horned lark, and brown-headed cowbird, but all of these species had an encounter rate of zero. Red-winged blackbirds are local year-round residents and transient migratory species in this region of North Dakota and may be at the greatest fatality risk during the spring and fall due to their flocking characteristics, which may also be contributing to their relatively high encounter rate in comparison to other species.

The red-winged blackbird (Kerlinger et al. 2006; Thelander et al. 2003), horned lark (Johnson and Erickson 2011; Downes and Gritski 2012), American crow (Downes and Gritski 2012; Jain et al. 2007), brown-headed cowbird (Erickson et al. 2014), and western meadowlark (Johnson and Erickson 2011; Thelander et al. 2003) have been documented as fatalities at other wind energy projects according to publically available data, particularly the horned lark which exhibits breeding flight displays that may bring them into the height of the RSA (Johnson and Erickson 2011). The red-winged blackbird, horned lark, and western meadowlark were among the 25 most commonly detected collision fatalities at wind energy facilities (Erickson et al. 2014). American robin was the only other species observed in Project Area point counts that was among the 25 most commonly detected collision fatalities. Although risk of turbine-related fatalities at the Project exists for each of these species, should they occur, they are unlikely to have population-level impacts because North Dakota populations for each species are large and relatively stable (8.2 million-red-winged blackbird, 4.3 million – horned lark, 5.6 million – western meadowlark; PIFSC 2013; Sauer et al. 2012).

Although non-raptor mortality due to collision is expected to be low, collision fatalities are a cause of concern to Brady Wind. To monitor and minimize collision fatalities to the extent practicable, Brady Wind will implement fatality monitoring for one year (Section 8.0) and adaptive management for the life of the Project (Section 10.0).

Electrocution

Utility lines, particularly distribution lines, can potentially result in electrocution of large raptors because their wing span is large enough that the bird can simultaneously contact two conductors or a conductor and grounded hardware (APLIC 2006). Utility lines generally pose less of a threat to non-raptors because of their smaller wing spans. However, any structures that allow for circuit completion (i.e. flesh-to-flesh contact between energized parts or an energized and grounded part) pose an electrocution risk. Avian electrocutions typically occur on distribution lines with voltages less than 60 kilovolts. The risk of electrocution at the Project is likely to be low due to measures Brady Wind will undertake to prevent electrocution. See Section 7.0 for details of avoidance and minimization measures.

Disturbance/Displacement

In addition to mortality associated with wind farms, concerns have been raised that some bird species may avoid areas near turbines after the wind farm is in operation (Drewitt and Langston 2006). For example, at the Buffalo Ridge wind energy facility in Minnesota, densities of male songbirds were significantly lower in CRP grasslands containing turbines than in CRP grasslands without turbines though the causal mechanism was not studied (Leddy et al. 1999). Reduced abundance of grassland songbirds was found within 50 meters (m) of turbine pads for a wind farm in Washington and Oregon, and the investigators attributed displacement to the direct loss of habitat or reduced habitat quality and not the presence of the turbines (Erickson et al. 2004). Research at two sites in North and South Dakota (Shaffer and Johnson 2009) suggests that certain grassland songbird species (two of four studied) may avoid turbines by as much as 200 m, but these results have not been finalized or verified at additional sites. None of these studies have addressed whether these avoidance effects are temporary (i.e. the birds may habituate to the presence of turbines over time) or permanent. Pearce-Higgins et al. (2012) found little evidence for a post-construction decline for ten species of birds at wind projects in upland habitats in the United Kingdom.

Project construction activities and the presence of turbines and other Project features may disturb or displace birds, particularly species of habitat fragmentation concern. Many of the species detected during bird surveys likely breed in the Project Area, suggesting potential for impact to breeding birds. However, the impacts to birds from disturbance or displacement from the Project are likely to be low based on the relatively low bird use in the Project. The limited amount of native grassland habitats combined with heavy agricultural use within the Project Area suggests that the additional disturbance and habitat loss caused by construction and operation of the Project will not cause birds to avoid the Project Area, nor should it alter the current use of habitat by bird species within the Project Area. The risk of disturbance/displacement will be further reduced through avoidance and minimization measures

taken during the design, construction, and operational phases of the Project (Section 7.0), which includes establishing non-disturbance nest buffers during the breeding season on active nests.

Species of Habitat Fragmentation Concern

Two species of habitat fragmentation concern, northern harrier and sharp-tailed grouse, have been detected in the Project Area.

Collision

Northern harriers have seldom been recorded as fatalities at other wind farms with publicly available data; this may be because the majority of foraging flights for the northern harrier occur below typical RSA heights (Whitfield and Madders 2006). Breeding males typically deliver prey to breeding females in an aerial pass (MacWhirter 1994, as cited in Smith et al. 2011), which may place birds in the rotor-swept zone near their nests. The risk of turbine-related fatalities of northern harriers at the Project is expected to be low given the typical flight behavior exhibited by the species and the low encounter rate of 0.00 birds flying at the RSA height/20 minutes within the Project Area.

Sharp-tailed grouse fatalities are uncommon at operating wind farms according to publicly available data. This may be because this species generally flies at heights less than 100 m (Connelly et al 1998) and typically fly beneath the RSA. During fall avian surveys, sharp-tailed grouse had a mean use of 0.25 birds/20 minutes and were observed in 5.0 percent of all surveys; during spring avian surveys, mean use was 0.01 birds/20 minutes and were observed in 0.4 percent of all surveys. However, the encounter rate was 0.00 in both seasons, as none were observed flying at the height of the RSA. The risk of turbine-related collision fatalities are expected to be low based on this species' typical flight behavior and low encounter rate at the Project Area. In addition, Project-related fatalities of sharp-tailed grouse, should they occur, are unlikely to have population-level impacts because North Dakota populations are large and relatively stable (170,000 birds; PIFSC 2013; Sauer et al. 2012). Sharp-tailed grouse are also a popular game bird throughout its range; however, there is little evidence that harvest adversely affects populations (Connelly et al. 1998).

Disturbance and Displacement

In the Midwestern US, nesting by northern harriers occurs in wetlands, on reclaimed mines and in CRP fields planted in non-native grasses (Dechant et al. 2002). A before-after/control impact study of avian use at the Buffalo Ridge Wind Resource Area in Minnesota found evidence that northern harriers avoided turbines on small (≤ 100 m from turbines) and large (105 - 5,364 m) scales the year following construction. Such avoidance was not detected in a study conducted two years post-construction (Johnson et al. 2000), suggesting that any displacement effect of a wind farm on the species may be temporary.

Sharp-tailed grouse could be affected by Project development if Project infrastructure disturbs or displaces grouse from leks or areas of preferred habitat (grasslands). There are four known leks within the Project Area and two within one mile of the Project Area; disturbance caused by

turbines and other Project infrastructure may displace grouse from leks. Current research suggests that certain grouse species may avoid anthropogenic structures (Hagen et al. 2011; USFWS 2013a) but the effect of tall structures on birds is still not well understood (Walters et al. 2014). Males may tolerate various types of disturbance more than females (Connelly et al. 1998). The Project Area; however, is largely used for agricultural purposes and is disturbed, and the native grassland habitat will be avoided to the extent feasible by the Project. This reduces the likelihood of disturbance and displacement impacts on the sharp-tailed grouse. The risk of disturbance/displacement will be further reduced through avoidance and minimization measures taken during the design, construction, and operational phases of the Project (Section 7.0), which includes establishing non-disturbance nest buffers during the breeding season on active nests. All six leks found during Project surveys were checked prior to construction to determine whether temporal buffers should be established on active leks during construction. Leks were checked on May 11 and 12, May 17, and June 7, 2016. All leks were inactive (unoccupied) by June 7.

Birds of Conservation Concern

Three BCC species were observed in or near the Project Area during fall 2015 avian surveys: bald eagle, golden eagle, and ferruginous hawk and three during spring 2016 surveys: grasshopper sparrow, marbled godwit, and upland sandpiper. These are discussed in the following sections.

Two additional BCC species that were not observed during Project surveys but that have been detected on independent surveys (BBS and CBC surveys, see Tables 3 and 4) in the vicinity of the Project Area have the potential to occur within the Project Area. These species, short-eared owl and loggerhead shrike, have also been found as fatalities at operating wind farms according to publicly available data. Neither of these species were observed during fall or spring avian point-count surveys. Of the two species, short-eared owl was the most commonly detected as fatalities at operating wind farms; loggerhead shrike fatalities were uncommon. Short-eared owl has a United States population of 200,000, (PIFSC 2013), whereas loggerhead shrike populations are larger at 4.9 million. The risk of direct impacts will be reduced through avoidance and minimization measures implemented during the design, construction, and operational phases of the Project (Section 7.0), which includes establishing non-disturbance nest buffers during the breeding season on active nests.

Raptors

Despite the observation that most bird fatalities at wind farms are songbirds, raptor mortality historically has received the most attention. Raptor mortality at newer wind projects has been low relative to older-generation wind farms, although there is substantial regional variation in raptor mortality rates (Erickson et al. 2002; Erickson et al. 2004; Johnson et al. 2002; Kerns and Kerlinger 2004; Jain et al. 2007).

Collision

A recent meta-analysis suggests that pre-construction studies provide poor indicators of post-construction mortality (Ferrer et al. 2012). A general pattern is that high raptor use (greater 2.0 birds/20 minutes) has often been associated with high raptor mortality at wind farms (Strickland et al. 2011). Conversely, raptor mortality often appears to be low when raptor use is low (< 1.0 birds/20 minutes; Strickland et al. 2011). In the case of this Project, overall raptor use was 1.07 birds/20 minutes in the fall and 0.56 birds/20 minutes in the spring, which is near and below the low mean use threshold of 1.0 birds/20 minutes suggested by Strickland et al. (2011).

Swainson's hawk, northern harrier, and red-tailed hawk had the highest mean use in fall (0.26, 0.26, and 0.23 birds/20 minutes, respectively) and Swainson's hawk and northern harrier had the highest mean use in spring (0.20 and 0.14 birds/20 minutes, respectively) for the raptor species group during point-count surveys, and were also among the most frequently detected raptor species at the Project Area in both seasons. Although the Swainson's hawk and red-tailed hawk had similar mean use and frequency rates to the northern harrier in fall, their encounter rates differed (0.15, 0.16, and 0.00 birds flying at RSA height/20 minutes, respectively). In spring, encounter rates for Swainson's hawk and norther harrier were low (0.05 and 0.00 birds flying at RSA height/20 minutes, respectively). These species are commonly associated with agricultural and grassland prairie habitats, which are present within the Project Area and provide opportunities for foraging, an activity associated with susceptibility to turbine collisions (Thelander et al. 2003).

Swainson's hawk and northern harrier fatalities have been recorded at operating wind facilities (Erickson et al. 2002; Young et al. 2003; Erickson et al. 2004; Gritski et al. 2010; Johnson and Erickson 2011). Five occupied Swainson's hawk nests were found in the Project Area during summer 2015 surveys and two additional occupied nests were found within the 2-mile buffer. In spring of 2016, one Swainson's hawk nests was found within the Project Area and two others were found within the 2-mile buffer during raptor nest surveys. While this may increase the risk for collisions during nesting activities. However, given the low mean use of Swainson's hawks within the Project Area, low encounter rate, and the fact that they are not commonly detected as wind farm fatalities (according to publicly available data); turbine-related fatalities at the Project are likely to be low. Project-related fatalities of Swainson's hawk and northern harrier, should they occur, are unlikely to have population-level impacts because both species' populations are relatively stable (Sauer et al. 2012).

One ferruginous hawk was observed during fall avian use surveys, resulting in low mean use of the Project Area and an encounter rate of 0.00 birds flying at the RSA height/20 minutes, suggesting a low risk of collision with Project turbines. The ferruginous hawk is not commonly found as a fatality at wind energy facilities according to publicly available data. Additionally, low use of the Project Area and an encounter rate of 0.00 birds flying at the RSA height/20 minutes suggest a low risk of collision with Project turbines. Therefore, impacts on ferruginous hawks are expected to be low.

In a study of raptor response to wind farms, red-tailed hawks were observed engaging in high-risk flight behaviors at operational wind facilities whereas northern harriers were identified as having a low risk flight behavior for collisions (Garvin et al. 2011). Results from post-construction mortality monitoring studies indicate that red-tailed hawks are frequently found as turbine-related fatalities (Jain 2005; Grodsky and Drake 2011; Johnson and Erickson 2011). Drewit and Langston (2008) summarized that bird activity is typically higher near active nests than areas without active nests, as a result, red-tailed hawks may have increased potential for collision if they repeatedly fly within the Project Area during nesting activities and during the time when young begin to fledge from the nests. One occupied red-tailed hawk nest was found in the Project Area and two within the 2-mile buffer in 2015. One occupied red-tailed hawk nest was found in the Project Area, and four within the 2-mile buffer but not in the Project Area during the spring 2016 surveys; the presence of occupied raptor nests near the Project Area may increase the risk for collisions during nesting activities. However, Project-related fatalities are unlikely to have population-level impacts because red-tailed hawk populations in North America are relatively large and stable (2.0 million; PIFSC 2013; Sauer et al. 2012).

Other raptor species detected during fall and spring point counts included the turkey vulture, American kestrel, and merlin. Both turkey vultures and American kestrels are commonly found as fatalities at wind facilities (Erickson et al. 2002; Stantec 2010). However, a low encounter rate of 0.00 birds flying at the RSA height/20 minutes for both of these species suggests a low risk for turbine collisions at the Project.

Electrocution

Fatalities of large raptors have occurred as a result of electrocution and collisions with utility lines and structures, particularly distribution lines (APLIC 2006). Due to their large size, raptors are able to bridge conductive elements to complete a circuit (APLIC 2006). Therefore, any structures that allow for circuit completion (i.e., flesh-to-flesh contact between energized parts or an energized and grounded part) pose an electrocution risk. To protect birds from possible electrocution, the Avian Power Line Interaction Committee (APLIC) recommends that lines have a horizontal separation of 60 inches and a vertical separation of 40 inches between phase conductors or between a phase conductor and grounded hardware (APLIC 2006). Therefore, the risk of electrocution for raptors, including the ferruginous hawk the Project is likely to be low because all collection lines will be buried and all overhead lines and the generation interconnection tie line will be constructed following a manner consistent with APLIC guidelines for the design of overhead lines (see Section 7.0).

Disturbance and Displacement

Raptors may be vulnerable to disturbance from many types of human activity. Human disturbance may result in direct and indirect impacts to raptor habitat, occupancy, and nesting success (USFWS 2008b). Direct impacts may include the loss of foraging or nesting habitat within the Project Area, direct mortality (e.g., due to collisions with wind turbines, electrocution by power lines), noise disturbance (e.g., construction noise), and loss of nest sites or winter roost sites (USFWS 2008b).

Disturbance or displacement nesting raptors is possible if birds are nesting or have preferred foraging areas within line-of-sight of the Project facilities. A number of studies conducted at western wind energy facilities suggest that wind energy facilities do not have long term impacts on raptor nest densities (Howell and Noone 1992; Erickson et al. 2004; Johnson et al. 2003; Young et al. 2006; Gritski et al. 2008). For example, post-construction studies at an Oregon project found that raptor nests more than 0.5 miles from turbines were not impacted by project disturbance (Gritski et al. 2008). Studies have also found no clear relationship between nest occupancy and distance from turbines (Johnson et al. 2003; Young et al. 2006). Suitable raptor nesting habitat within the Project Area is limited; there are few trees sufficient to support raptor nests, there is no cliff nesting habitat, and there are no large waterbodies that would attract nesting bald eagles. The nearest potential ferruginous hawk nests are 2.1-5.9 miles outside the Project Area. Given the number of known of raptor nests within the Project Area and two-mile buffer, some nesting raptors may be disturbed or displaced by construction activities. However, disturbance and displacement of raptors will be minimized through the implementation of avoidance and minimization measures described in Section 7.0.

Eagles

Collision

No bald eagles or their nests were found within the Project Area or two-mile buffer surrounding the Project Area during the nest survey; however, there are two bald eagle nests and several observations of individuals within 10 miles of the Project Area. The nearest occupied bald eagle nest to the Project Area is three miles from the nearest turbine. Although bald eagles have a low likelihood of breeding within the Project Area due to a lack of suitable nesting habitat, bald eagles nesting in the vicinity of the Project could occur in the Project Area when foraging or migrating. Six bald eagle mortalities associated with wind energy facilities within the United States were reported from 1997 through June 2012 (Pagel et al. 2013). To date, one bald eagle mortality has been reported at a wind energy facility in North Dakota (Public Prairie Broadcasting 2015). Bald eagles are believed to be at less risk of turbine collision than golden eagles because they tend to focus their hunting efforts for fish and waterfowl in lakes and rivers (Buehler 2000). However, cattle carcasses and prairie dog colonies could also serve as attractants to nearby bald eagles. Although bald eagle collisions with turbines are possible, the likelihood of collisions is reduced due to the lack of nests and suitable nesting habitat within the Project Area and will be minimized through the implementation of avoidance and minimization measures described in Section 7.0.

No golden eagles or their nests were found within the Project Area or two-mile buffer surrounding the Project Area during the nest survey; however, there are three known golden eagle nests and several observations of individuals within 10 miles of the Project Area. Although golden eagles have a low likelihood of breeding within the Project Area due to a lack of suitable nesting habitat, golden eagles nesting in the vicinity of the Project Area could occur in the Project Area when foraging or migrating. In addition, cattle carcasses and prairie dog colonies within the Project Area could serve as attractants to golden eagles. Seventy-nine golden eagle

mortalities associated with wind energy facilities within the United States were reported from 1997 through June 2012, excluding the Altamont Pass Wind Resource Area in California (Pagel et al. 2013.); however, to date no golden eagle mortalities have been reported at wind energy facilities in North Dakota. Golden eagles are believed to be more at risk of turbine collision than bald eagles because they hunt for land-based prey along topographic contours where turbines are often located (Kochert et al. 2002). Collision impacts on golden eagles will be minimized through the implementation of avoidance and minimization measures described in Section 7.0.

Electrocution

APLIC recommends that lines have a horizontal separation of 60 inches (150 cm) and a vertical separation of 40 inches (100 cm) between phase conductors or between a phase conductor and grounded hardware (APLIC 2006). Therefore, the risk of electrocution for eagles at the Project is likely to be low because all collection lines will be buried and all overhead lines and the generation interconnection tie line will be constructed following a manner consistent with APLIC (2006) guidelines for the design of overhead lines (see Section 7.0).

Disturbance and Displacement

Due to the lack of foraging habitat (large bodies of water) and nests within two miles of any turbines, it is unlikely that foraging or nesting bald eagles will be displaced or disturbed by the Project. There is some evidence that bald eagles avoid operating wind turbines (Sharp et al. 2012), but this avoidance appears to be over short distances rather than displacement from the entire wind farm.

It is unlikely that nesting golden eagles will be disturbed or displaced due to the lack of nesting habitat and absence of golden eagle nests within the Project Area. However, golden eagles may be disturbed or displaced from the Project Area if infrastructure interferes with hunting or availability of prey. Most known prairie dog colonies in the vicinity are outside of the Project Area, but there is one colony within the Project Area.

Whooping Cranes

Collision

Whooping cranes may be directly affected by the Project through collision with wind turbines or associated power lines. No whooping crane observations were documented in the Project Area; however, the Project is located within the 95 percent isopleth of the whooping crane migration corridor.

To date, no whooping crane mortality has been attributed to collision with wind turbines at any facility. Whooping cranes typically fly at altitudes higher than the tallest proposed turbine height (431 feet at the tip of an upright turbine blade); however, individuals fly at lower altitudes in response to climate conditions (e.g., low cloud cover), while searching for a stopover location and while landing, taking off, and moving between roosting and foraging locations. It is during these low flight times that the cranes are at the highest risk for collision with turbines and power lines. Although collision with turbines or transmission lines is a risk, cranes have been

documented altering flight direction in response to turbines at a wind facility in South Dakota (Nagy et al. 2012), and multiple studies have documented sandhill cranes gradually climbing as they approach marked power lines (Morkill and Anderson 1991; Murphy et al. 2009). The risk of whooping crane collisions with power lines will be reduced by marking the portions of the overhead transmission line that are within 0.5 mile of wetland that could provide suitable stopover habitat (see Section 7.0). However, our analysis of the transmission line did not reveal any suitable wetlands within 0.5 miles of the line. In addition, if a whooping crane is observed within the Project or overhead of the turbines, all operations turbines will be voluntarily curtailed until the bird is confirmed to be no longer within the project.

Electrocution

Electrocution is unlikely for whooping cranes because they are ground-nesting birds, adapted to foraging on the ground, and are not known to perch or nest on or near the conductive elements of power lines.

Disturbance and Displacement

Land use within the Project Area consists mainly of active grazing or agricultural production with a limited extent of wetlands within the Project Area. The wetland-agricultural habitat matrix preferred by whooping cranes as stopover habitat exists within the Project Area; however, it also exists in the surrounding landscape (Tetra Tech 2015b). Given that the Project Area is on the outer edge of the known migration corridor and is not more attractive than the surrounding area, it is unlikely that whooping cranes will be displaced from the Project Area or that Project operations will disturb them.

6.1.1.2 Indirect Impacts on Birds

General Avian Species

Habitat Loss and Fragmentation

Birds may be adversely affected by habitat loss and fragmentation due to Project development. Habitat fragmentation can exacerbate the problem of habitat loss for birds by decreasing patch area and increasing edge habitat. Habitat fragmentation can reduce bird productivity through increased nest predation and parasitism and reduced pairing success of males (Robinson et al. 1995). However, the increase in the amount of habitat loss and fragmentation as a result of Project construction will be minimized by the use of existing roads to the extent practicable and lands already altered by agriculture and cattle grazing, as well as reseeding disturbed grasslands, if approved by the landowner. Additionally, Brady Wind will follow all requirements of the Project's Storm Water Pollution Prevention Plan to control erosion and pollutants.

Decreases to Population

The primary species observed during Project surveys were red-winged blackbird, mourning dove, ring-necked pheasant, brown-headed cowbird, and horned lark; thus, risk of turbine-related fatalities exists for each of these species at the Project. However, Project-related

fatalities of these species, should they occur, are unlikely to have population-level impacts because North Dakota populations for each species are large (8.2, 4.1, 2.0, 12.0, and 4.3 million each respectively; PIFSC 2013). In addition, locally breeding songbirds may experience lower mortality rates than migrants because many of these species tend not to fly at turbine heights during the breeding season. However, some breeding songbird species have behaviors that increase the risk of collisions with turbines. For example, horned larks have been commonly found as fatalities at wind farms, and mortality may be partially attributed to the breeding flight displays within the RSA (Pickwell 1931; Johnson and Erickson 2011). Most songbirds are short-lived and have high reproductive output, and their population growth rates are more sensitive to reproductive failure than to adult survival (Stahl and Oli 2006; Arnold and Zink 2011). Therefore, collision mortality for most songbird species is expected to have negligible effects on population dynamics.

Avoidance and minimization measures will be implemented during all phases of the Project to reduce the possibility of population-level impacts on all bird species (see Section 7.0).

Birds of Habitat Fragmentation Concern

Habitat Loss and Fragmentation

Three avian species of habitat fragmentation concern were observed during avian surveys within the Project Area: northern harrier (107 observations), sharp-tailed grouse (60 observations), and upland sandpiper (one observation). These observations were during the fall and spring migration periods. According to the NLCD, the Project Area is 69 percent cultivated cropland and pasture/hay and 25 percent grasslands (Jin et al. 2013), much of which is already disturbed, fragmented, and managed for agriculture, cattle grazing, and impacted by introduced grass species. While each of these species may be breeding within the Project Area, they expected to be in low numbers due to the existing habitat fragmentation. Project development is not expected to add any additional loss of habitat due to fragmentation. In addition, Brady Wind will avoid further fragmentation of high quality native grassland, which will help reduce impacts on these species.

Decreases to Population

The three species of habitat fragmentation concern observed within the Project Area (northern harrier, sharp-tailed grouse, and upland sandpiper) are expected to occur in low numbers and therefore any fatalities are also expected to be low. Project-related fatalities of these species, should they occur, are unlikely to have population-level impacts because populations are relatively stable or increasing in North Dakota (Sauer et al. 2012).

Sprague's pipit was not observed during Project surveys but has the potential to occur within the Project Area during the breeding season in areas with native grassland. Sprague's pipit populations are declining (Sauer et al. 2012) and the North Dakota population is estimated at 60,000 (PIFSC 2013). Population-level impacts on Sprague's pipit from the Project may be more likely than those to other species; therefore, Brady Wind will avoid impacting suitable habitat for the species to the extent practicable.

Birds of Conservation Concern

Indirect impacts to bald eagle, golden eagle, ferruginous hawk, prairie falcon, and grasshopper sparrow, BCC species observed within and in the vicinity of the Project Area, are similar impacts identified under general avian species.

Habitat Loss and Fragmentation

Short-eared owl and loggerhead shrike are BCC species observed in Project vicinity, but not within the Project Area. These species, which occur in grasslands, have been documented as fatalities at operating wind farms and could be sensitive to habitat fragmentation. Grasshopper sparrow is a BCC species and also a USFWS species of habitat fragmentation concern that was observed during Project surveys, and it could be impacted by fragmentation of grassland habitat. However, the grasshopper sparrow population in the United States is large and stable (30 million, PIFSC 2013). Brady Wind will avoid areas of high quality grassland to the extent practicable in order to minimize habitat loss for grassland dependent species. Grassland fragmentation will be avoided and minimized through implementation of mitigation measures during the design, construction, and operation phases of the Project (Section 7.0).

Decreases to Population

Of the BCC species within or in the vicinity of the Project Area, the majority have relatively small populations (less than 100,000 birds in North Dakota), including ferruginous hawk (50,000 birds) and short-eared owl (19,000) (PIFSC 2013). Grasshopper sparrow and loggerhead shrike have relatively large populations in North Dakota (4 million and 100,000, respectively, PIFSC 2013). Ferruginous hawk populations are increasing in North Dakota whereas short-eared owl, grasshopper sparrow, and loggerhead shrike populations are declining in North Dakota (Sauer et al. 2012). Population-level impacts from the Project on species with low numbers or declining populations may be more likely than those to other species; therefore, Brady Wind will avoid impacting these species and their habitat to the extent practicable, as outlined in Section 7.0.

Raptors

Habitat Loss and Fragmentation

Raptors that use the Project Area may be indirectly impacted by the Project. Indirect impacts may include habitat degradation and fragmentation and reduction or changes in available prey species (USFWS 2008b). Overall, habitat degradation and fragmentation due to Project construction will be minimal due to the existing disturbed nature of the Project Area and the small permanent footprint of the Project relative to the Project boundary. Impacts to native grassland will be avoided and minimized according to the mitigation measures in Section 7.0. The Project Area is primarily cropland and pastureland, which offers habitat for small mammals that are prey sources for raptors. Due to the small Project footprint, which will allow prey sources for raptors to persist post-construction, impacts on availability of prey species are expected to be minimal.

Decrease to Population

Swainson's hawk, northern harrier, red-tailed hawks, and northern harriers were the most common raptor species detected during the avian surveys within the Project Area. All species are commonly associated with agricultural and grassland habitats (Thelander et al. 2003). Swainson's hawks have been found as fatalities at existing wind farms. Their populations are relatively small but stable in North Dakota (30,000, PIFSC 2013; Sauer et al. 2014). Risk of collision by northern harriers is believed to be low because the majority of foraging flights occur below typical RSA heights (Whitfield and Madders 2006). Although red-tailed hawks are frequently found as turbine-related fatalities (Jain 2005; Grodsky and Drake 2011; Johnson and Erickson 2011), any Project-related fatalities are unlikely to have population-level impacts because red-tailed hawks are common nationwide (Sauer et al. 2012).

Avoidance and minimization measures will be implemented during all phases of the Project to reduce the possibility of population-level impacts on all bird species (see Section 7.0).

Eagles

Habitat Loss and Fragmentation

Indirect impacts on bald and golden eagles relating to habitat loss and fragmentation are similar to those discussed for other raptors (see Section 6.1.1.2.4); impacts on bald eagles' prey species may differ slightly. Bald eagles typically hunt in large bodies of water for fish, as well as scavenge. There are no large bodies of water within the Project Area; therefore, Project development would not reduce or change live bald eagle prey species; however, it is possible that turbine operation will cause bald eagles to avoid some areas where they may have foraged for carrion in the past.

Decrease to Population

Bald and golden eagle populations appear to be generally increasing or stable in North Dakota (Sauer et al. 2012) and the larger Badlands and Prairies BCR (Millsap et al. 2013). However, their population sizes are relatively small when compared to other raptors and they are fairly uncommon; the USFWS estimated that there were 67 nesting pairs of bald eagles in North Dakota in 2009 (USFWS 2016a). The golden eagle breeding population in North Dakota is estimated at about 400 birds (PIFSC 2013). Due to their low population numbers, eagles may be susceptible to population-level impacts; therefore, Brady Wind will avoid impacting these species and their habitat to the extent practicable, as outlined in Section 7.0.

Whooping Cranes

Habitat Loss and Fragmentation

Potential indirect effects to the whooping crane posed by the Project include avoidance of structures (e.g., turbines, meteorological towers, and transmission lines), habitat loss and fragmentation, and disturbance caused by anthropogenic activities. Because cranes may avoid turbines by altering flight paths, the USFWS (2009) holds the opinion that such avoidance will

lead to avoidance of stopover in areas with operational wind turbines. Behavioral avoidance of wind farms by whooping cranes, while reducing the probability of direct impacts through collision, may amount to loss of stopover habitat. The loss of stopover habitat use through avoidance; however, may be relatively small given the large amount of suitable habitat present within the migration corridor (Western and USFWS 2015). This is likely the case for the Project as nearby suitable habitat continues to be present outside of Project boundaries. If stopover in the area occurs, the potential for disturbance to whooping cranes exists primarily during the construction phase of the Project.

It has been assumed that whooping cranes prefer areas isolated from human disturbances when available. Studies on whooping crane migration habitat and use, and the diminution of this habitat with increasing development, point to an inverse relationship between disturbance level and habitat value (Austin and Richert 2001; USFWS 2009). Placing wind turbine structures in already developed areas, would likely have less impact than placement in areas where there are no existing disturbances. The Project turbines are sited close to existing section line roads and the majority of turbines are sited within active pasture or agricultural fields. Although none of these factors excludes the possibility of crane use of the Project Area, in combination it is likely that they make the attractiveness of the location less appealing than habitats surrounding the Project Area.

Decrease to Population

The population of whooping cranes is estimated at 329 birds (with a 95% probability of actual flock size being between 293–371 birds) as of the 2015/2016 winter whooping crane survey conducted by USFWS (2016c). Due to the small population, any Project-related fatalities would have population-level impacts. Brady Wind will avoid impacting these species and their habitat to the extent practicable, as outlined in Section 7.0.

6.1.2 Bat Impacts

6.1.2.1 Direct Impacts on Bats

General Bat Species

Collision

Bats have been identified as a wildlife group at risk due to collisions or other interactions with wind turbines (Erickson et al. 2001; Drewitt and Langston 2006; Arnett et al. 2007; Arnett et al. 2008). Bat collision mortality at wind farms is a widespread phenomenon, commonly exceeding avian collision mortality (Kunz et al. 2007). Of 46 species of bats in North America, 11 species have been identified among fatalities at wind farms. Migratory foliage or tree-roosting bat species (hoary bat, eastern red, and silver haired bat) appear to be most susceptible to collision with wind turbines. These species have experienced the highest fatality rates at wind energy facilities in North America, particularly during the spring (March – May) and fall (August – October) season when activity levels increase as these species migrate (Cryan 2003; Kunz et al. 2007; Arnett et al. 2008). Studies of wind energy facilities in the Midwest with

agriculture/grassland habitat have documented Brazilian free-tailed, hoary, eastern red, silver-haired, little brown, big brown, and tricolored as fatalities during mortality surveys (Table 14). Few among these studies occur within the range of Brazilian free-tailed bat, but for the three that did, Brazilian free-tailed bats averaged 63.5 percent of fatalities (Miller 2008; Tierney 2009; Piorkowski and O'Connell 2010).

The relationship between activity and mortality has yet to be clearly identified, but we assume that regional fatality patterns are indicative of potential risk at the Project Area. Recent research has shown that mean wind speed and mean ambient temperature have the greatest effects on bat activity patterns, and that bat activity is generally lower at low mean nightly temperatures and wind speeds above 5 meters/second (Weller and Baldwin 2012). Bat fatality rates at wind energy facilities in the Midwest region average 17.25 ± 12.05 (90-percent confidence interval) bats/turbine/year or 13.4 ± 9.00 bats/MW/year (Table 14). Of the 11 bat species that may occur in the Project Area (Section 3.2.2), five have been found during mortality searches at operating wind farms in agricultural/grassland habitat (Table 14). Of these species, the migratory tree bats are considered to be at the greatest risk from wind energy projects (Tierney 2009).

In addition to migration, habitat within the Project Area may attract bats and potentially put them at risk of collision with turbines; therefore, the overall risk of collision impacts to bats at the Project is considered moderate. However, the limited roosting habitat within the Project Area is a major limiting factor for use of the Project Area by migrating bats. Therefore, bat migration through the Project Area is likely low in magnitude. To better understand Project impacts on bats, Brady Wind will conduct one year of post-construction fatality monitoring.

Disturbance/Displacement

Disturbance and displacement have not been identified as risks associated with bats and operational wind farms in reviews of bat-wind turbine impacts (Kunz et al. 2007), and bats are known to habituate to anthropogenic structures (Keeley and Tuttle 1999). Given the history of agricultural activity in the Project Area, we expect that the local bat community would remain in the area at similar population levels after construction of the Project. Although construction and operation activity may change the noise environment in the Project Area during daylight hours; Project-related noise levels are not anticipated to have deleterious effects on resident or migrant bats due to bats' nocturnal nature.

Northern Long-eared Bat

The northern long-eared bat is the only listed bat species with the potential to occur within the Project Area. Under the final Section 4(d) rule, incidental take of NLEB is prohibited within the USFWS WNS zone, which includes all counties affected by WNS and an additional 150-mile (241-kilometers) buffer around these counties (USFWS 2016b). Lethal take by operating wind turbines is specifically excluded from this prohibition. Take incidental to otherwise lawful activities is not prohibited outside of the WNS zone designated by USFWS. The Project Area is outside of the WNS where incidental take due to hibernacula disturbance or tree removal is prohibited under the final 4d rule. Although no northern long-eared bats were detected during

fall acoustic monitoring, the Project Area is within the species' range. If present, direct impacts could include collision with turbine blades, habitat disturbance by removal of roost trees, or disturbance to hibernacula. The Project Area contains less than one percent of forested habitat (based on NLCD data) that would be desirable for roosting and breeding by northern long-eared bat. No hibernacula are known in the state (USFWS 2013c). Moreover, no northern long-eared bat fatalities from wind energy facilities have been documented in North Dakota (Western and USFWS 2015). Based on the limited quantity of suitable habitat and the lack of documented detections within the Project Area, direct impacts on the northern long-eared bat or their habitat are low.

6.1.2.2 Indirect Impacts on Bats

General Bat Species

Habitat Loss and Fragmentation

The impacts of habitat fragmentation from wind development on bats are not well-known (Kuvlesky et al. 2007). Both roosting and foraging habitat within the Project Area are limited in availability due to large amounts of open-land agriculture and few large permanent sources of surface water. In addition, the Project has a relatively small footprint of temporary and permanent disturbance. For these reasons, the risk of habitat loss and fragmentation is low.

Northern long-eared Bat

Indirect impacts on northern long-eared bat could include habitat loss and fragmentation. However, due to the lack of known occurrences or hibernacula of northern long-eared bat within the Project Area, the existing fragmented nature of the Project Area, and lack of large tracts of forested habitat, indirect impacts are not expected.

6.1.3 Impacts to Dakota Skipper

6.1.3.1 Direct Impacts

The Dakota skipper is not known to occur in Stark County, and the Project Area is on the western extent of the species' range. However, approximately 30 percent of the Project Area was classified as Excellent/Likely or Good/Possible potential Dakota skipper habitat and approximately four percent was undetermined. Therefore, presumably the Dakota skipper could be present with the Project Area within areas of suitable habitat. If present, direct impacts on the Dakota skipper could include collision with Project vehicles or disturbance and/or displacement from preferred habitat. Brady Wind has avoided locating Project facilities on lands classified as Excellent/Likely, and has avoided locating Project facilities on lands classified as Good/Possible as much as feasible (Figure 7b). Therefore, the impacts of the Project on the Dakota skipper are likely to be low.

6.1.3.2 Indirect Impacts

The Dakota skipper is not known to occur in Stark County, and the Project Area is on the western extent of the species' range. However, approximately 30 percent of the Project Area was classified as Excellent/Likely or Good/Possible potential Dakota skipper habitat and approximately four percent was undetermined. If suitable habitat for the Dakota skipper is fragmented by Project construction, it could impact the species if it is present within the Project Area. Brady Wind has avoided locating Project facilities on lands classified as Excellent/Likely, and has avoided locating Project facilities on lands classified as Good/Possible where practicable, thereby minimizing any potential impacts on the Dakota skipper.

6.1.4 Cumulative Impacts

Activities that currently exist within the Project Area and vicinity are primarily limited to agriculture. Wind energy development removes less total land from agricultural use than other forms of development. Except for the physical locations of the turbines, access roads, and other facilities, all the land surrounding the Project facilities will be available for grazing and farming. The exploitation of oil is an existing industrial component of the landscape in Stark County, with approximately 26 percent of the county covered by oil fields (NDDMR 2015a). Oil production is expected to increase in Stark County (NDDMR 2015b). In addition to the Project, there are six existing wind farms in the vicinity of the Project, including Thunder Spirit Wind Farm south of the Project Area near Hettinger in Adams County, and the four-phased Bison Wind Energy Center northeast of the Project Area near New Salem in Oliver and Morton counties. The Project is located adjacent to the northern boundary of the proposed Brady II Wind Energy Center. It is expected that wind energy development will continue in southwestern North Dakota.

With regard to the potential cumulative impacts to wildlife resources, there is potential for the Project to affect local wildlife both directly (mortality) and indirectly (habitat loss and fragmentation). Both direct and indirect potential impacts would be avoided and minimized to the extent practicable, and therefore, are not expected to cause cumulative impacts. Although the wind turbines would contribute to the utility/industrial component of the existing landscape, the area would remain primarily agricultural in nature. As these agricultural lands are of minimal value to wildlife compared to native vegetation, the Project is not expected to result in a cumulative loss of quality wildlife habitat. Based on the existing land use, location of existing and planned facilities, and known impacts from similar wind facilities in the area, it is expected that the Project would have minimal cumulative impacts to wildlife.

6.2 Risk Assessment Decisions

6.2.1 Decision Criteria to either Abandon or Advance

6.2.1.1 Tier 1/Tier 2 Questions

Results of the Initial Site Evaluation indicate the majority of the Project Area is disturbed, fragmented, and managed lands for cattle grazing or agriculture (Section 3.2.3). Grasslands

have been tilled, mowed, and/or used for intensive cattle grazing making them low quality prairie habitats for most breeding birds. The anticipated avian community using the Project Area is composed of common species typically associated with agricultural and pasture lands of North Dakota. There are no critical areas of wildlife congregation within the Project Area. There are eight species of concern potentially occurring within the Project Area; these species' potential use of the Project Area and Project risks were evaluated in Sections 4.0 and 6.0. For many of these species, risk is likely low and can be managed through best management practices and avoidance and minimization measures (Section 7.0).

Based on the results of the Tier 1 Preliminary Site Evaluation (Section 4.1) and Tier 2 Site Characterization (Section 4.2), Brady Wind concluded the Project is viable for development within the Project Area.

6.2.1.2 What Are the Distributions, Abundance, Behaviors and Site Use of Birds and Bats, and What Project Elements Expose These Species to Risk?

Field studies (Section 5.0) were designed and are currently being implemented to document avian and bat use of the Project Area. The results of these studies will be used to predict the overall Project impacts to the avian and bat community, particularly during the migratory seasons when impacts would be the highest risk. The results of the studies conducted to date and the potential Project risks to the species documented or identified as potentially occurring are discussed in Section 5.0 and 6.0, respectively.

Based on the results of the Tier 1 Preliminary Site Evaluation, Tier 2 Site Characterization, and Tier 3 Field Studies, Brady Wind concluded the Project is viable for development within the Project Area.

6.2.1.3 What are the Potential Risks to Individuals and Local Populations of Birds and Bats and Their Habitats?

Based on the wildlife species that occur and are likely to occur, potential Project risks include direct and indirect impacts. Direct impacts include mortality due to collision with Project structures and electrocution, disturbance, and displacement. Indirect impacts could be adverse effects due to habitat fragmentation or habitat loss. A detailed risk assessment is presented above, in Section 6.1. No significant impacts to local populations of wildlife are anticipated from development of the Project.

Based on the results of the risk assessment, Brady Wind concludes that there will be no significant, unavoidable impacts on birds, bats, or other wildlife species and the Project is viable for development within the Project Area.

6.2.1.4 How Can Impacts to Birds and Bats Be Avoided and Minimized?

Brady Wind understands that the construction and operation of a wind energy facility may pose risks to birds, bats, and other wildlife. Brady Wind is committed to minimizing potential impacts on these resources and will implement conservations measures throughout the construction and operations phases of the Project. Conservation measures that will be implemented by the Project are detailed in Section 7.0.

6.2.1.5 What Studies Should Be Initiated and Continued Post-Construction to Evaluate Predictions of Impacts to Birds and Bats

Post-construction studies are essential to understanding whether pre-construction predictions of impacts and risks to birds, bats, and other wildlife are accurate. Therefore, Brady Wind will conduct formal post-construction fatality monitoring and implement an employee-based routine monitoring program. Details of these studies are presented in Section 8.0.

6.2.2 Decision of Need for Other Bird and Bat Conservation Plans

Brady Wind does not anticipate the need for additional bird or bat conservation plans based on the data collected to date. Brady Wind will coordinate with USFWS regarding ongoing surveys and assessments and further evaluate the need for additional plans as needed.

7.0 CONSERVATION MEASURES TO AVOID AND MINIMIZE ADVERSE IMPACTS

7.1 Siting and Design Measures to Avoid/Minimize Impacts

This section identifies impact avoidance and minimization measures that will be incorporated into the final design for the Project. These measures were derived from the voluntary WEG, industry Best Management Practices (BMPs), and the North Dakota Public Service Commission Final Order conditions. All avoidance and minimization measures implemented during the planning and design phase demonstrate practical means to reduce impacts to bird and bat species and their habitats.

- To protect birds from possible electrocution from the overhead transmission line, Brady Wind will maintain a horizontal separation of 60 inches and a vertical separation of 40 inches between phases and between phases to ground, as recommended by APLIC (2006). Additionally, the principles of isolation and insulation will be considered when retrofitting overhead electrical equipment, and Brady Wind will use pad-mounted transformers.
- Utility lines will be designed following APLIC (2012) guidelines to prevent bird collision. APLIC guidelines recommend the use of perch-diverters and/or specifically designed avian protection materials in areas where this distance is not feasible (APLIC 2006). In addition, structures will be of monopole design instead of lattice design to minimize opportunities for perching and nesting wherever feasible. Birds and bats could collide with electrical collection lines and redundant overhead telecommunication lines. Brady Wind will bury these lines.
- The Project overhead transmission line within 0.5 miles of wetlands that may provide stopover habitat for whooping cranes will be outfitted with bird flight diverters per APLIC

(2012) recommendations, which will minimize the potential for bird collisions with the lines.

- All turbines will sit on a tubular tower, and not a lattice structure, to minimize perching opportunities for raptors such as eagles and other birds.
- Access roads and turbines will be located away from wetlands and waterbodies to the greatest extent practicable to minimize impacts on aquatic species, semiaquatic species, birds, bats, and their habitat.
- No permanent impacts to potentially jurisdictional wetland areas will occur. Avoiding wetland impacts will generally reduce potential impacts to migratory birds and bats and sensitive habitat.

7.2 Construction Measures to Avoid/Minimize Impacts

- To reduce habitat disturbance and minimize the potential for wildlife mortality, equipment and vehicle travel will be limited to roads or specific construction pathways during construction. Construction traffic, parking, and laydown areas will be located within previously disturbed lands to the extent feasible. The construction footprint will be minimized in areas of native vegetation. Disturbed soil, if not replanted with crops, will be reclaimed with native seed following National Resources Conservation Service and Farm Service Agency recommendations per the North Dakota Public Service Commission requirements, if approved by the landowner.
- All trash and food-related waste will be placed in self-closing containers and removed daily from the site. This prevents trash from being exposed or blown around the Project Area and reduces attraction of wildlife to the Project Area.
- Vehicular speed will be limited to 25 miles per hour on Project roads to minimize vehicle collisions with wildlife.
- A site-specific worker environmental training program will be developed and implemented throughout the construction of the Project to inform workers of the biological resources present on-site to minimize wildlife impacts. All employees and contractors working in the field will be required to attend the environmental training session prior to working on-site. This training includes information regarding the sensitive biological resources, restrictions, protection measures, individual responsibilities associated with the Project, and the consequences of non-compliance. Written material will be provided to employees at orientation and participants sign an attendance sheet documenting their participation.
- To avoid habitat destruction, BMPs for fire prevention during construction will be implemented to minimize wildfire potential.
- Any use of pesticides, herbicides, fertilizers, and other chemicals will be in accordance with federal and state laws to minimize drift and other impacts on native habitat.

- Actual construction footprints and surface disturbance areas will be minimized during construction to minimize wildlife habitat disturbance. In addition, all native prairie will be avoided to the extent possible to minimize impacts on native prairie and the bird and wildlife species that rely on it.
- Removal of vegetation will be avoided within the peak bird nesting season to the extent feasible to avoid removing or disturbing nests.
- If construction takes place during the breeding season, pre-construction nest clearance surveys will be completed. Prior to construction, a sweep will be done of the construction area and non-raptor nests will be flagged and a 30 foot radius non-disturbance buffer placed around the nest. The buffers will be in effect until the young have fledged and can fly independently or until the nest fails.
- Prior to construction all six known sharp-tailed grouse leks will be checked to determine whether they were occupied. A non-disturbance buffer will be placed on any active leks during construction.
- Brady Wind will minimize impacts to existing trees and shrubs. If impacts to trees or shrubs cannot be avoided, the individual trees or shrubs will be replaced per North Dakota Public Service Commission regulations.
- During construction, disturbance to occupied raptor nests within the Project Area will be avoided by establishing a 0.25-mile radius non-disturbance buffer on the center of each active nest within the Project Area or along haul routes during the nesting season. Nest activity will be confirmed by a trained biologist prior to construction activities commencing. If a nest buffer is not practicable (along a public highway for example) then a trained nest monitor will observe the nest to determine that increased activity due to construction is not causing disturbance.
- To avoid injury or mortality of wildlife due to poisoning, an appropriately-sized emergency spill containment kit will be available to contain and remove spilled fuels, hydraulic fluids, and other potential pollutants when working within or near streams, lakes, or ponds.
- A Storm Water Pollution Prevention Plan will be developed for the construction site to prevent contamination of natural water resources, minimize erosion, storm water runoff, and transport of sediment and other contaminants.

7.3 Operational Measures to Avoid/Minimize Impacts

- Brady Wind will follow APLIC Guidelines for the marking the Project transmission line within 0.5 miles of suitable crane habitat and will design the transmission line to conform to APLIC suggested practices to the extent practicable (APLIC 2006, 2012). These standards are intended to protect raptors and other birds from collision and electrocution. These measures are sufficient to protect even the largest birds that may perch or roost on transmission lines or towers.

- Avian and bat fatalities will be evaluated during standardized post-construction fatality monitoring for one year following construction.
- Brady Wind will implement an Adaptive Management Program (Section 10.3) for avoidance, minimization, and mitigation of impacts to birds, bats, and other sensitive wildlife.
- Upon a positive discovery of a whooping crane on the ground inside the site boundaries, or overhead of the site array, the Fleet Performance & Diagnostics Center will be notified to initiate the site curtailment procedure. Site personnel will use technology specific procedure to properly shut down all operational turbines. The outage shall remain in effect until it can be confirmed through visual verification that there are no whooping cranes on either the ground or overhead of any turbines within a one mile radius for at least a length of 15 minutes. If necessary, a 2-man crew should follow the bird to the outer boundaries of the site in order to for verify that the Crane is no longer within the property.
- A site-specific worker environmental training plan will be developed and implemented throughout the Project operating life to inform workers of the biological resources present on-site to minimize wildlife impacts. All employees and contractors working in the field will be required to attend the environmental training session prior to working on site. This training will include information regarding the sensitive biological resources (with an emphasis on eagles and whooping cranes), restrictions, protection measures, individual responsibilities associated with the Project, and the consequences of non-compliance. Written material will be provided to employees at orientation and participants will sign an attendance sheet to document their participation.
- "Good housekeeping" procedures will be developed to keep the site clean of debris, garbage, carrion, fugitive trash or waste, and graffiti; to prohibit scrap heaps and dumps; and to minimize storage yards. This will prevent trash from being exposed or blown around the Project Area, and will avoid attracting predators and potential food sources for eagles and other predators (i.e. rodents and other small mammals) to the Project.
- Vehicle speeds will be limited to 25 miles per hour on Project roads to minimize vehicle collisions with wildlife.
- Road-killed animals or other carcasses (excluding eagles and other migratory birds) detected by personnel on or near roads within the Project Area will be removed promptly to avoid attracting eagles or other raptors to the Project Area.
- To avoid habitat destruction, BMPs for fire prevention during operation will be implemented to minimize wildfire potential.
- Brady Wind Energy Center workers and subcontractors will not be allowed to have firearms or pets at the Project and will be instructed to not disturb or harass wildlife.

- Lighting of the turbines will be pursuant to Federal Aviation Administration aviation hazard lighting standards. Brady Wind is proposing in its lighting plan to use the minimum number of aviation hazard lights acceptable to the Federal Aviation Administration.
- Brady Wind has voluntarily agreed to develop and implement this WCS in its continued efforts to demonstrate due diligence in avoiding and minimizing impacts to avian and bat species in association with development and operation of the Project.

7.4 Measures to Offset and/or Compensate for Habitat-Related Impacts

Up to 74 acres of the total Project Area will be permanently affected due to conversion to turbine sites, access roads, junction boxes, and the permanent meteorological towers, and up to 1,047 acres of land will be temporarily disturbed during construction for turbine installation, road construction, collection line trenching, temporary meteorological tower installation, and temporary crane paths. Approximately 93 percent of the area that is temporarily disturbed will be reclaimed. These impacts represent a minor portion of the land area available for agricultural production. As a result, the Project would not result in significant permanent impacts to agricultural areas used by birds, bats, and other wildlife.

Land where the turbines will be sited is primarily undeveloped pasture/hay, cropland, and grassland. Areas of the highest quality native prairie were avoided to the extent possible. Access road construction would result in the greatest effects to native vegetation, resulting in permanent loss of these habitats where they occur along selected routes. Installation of the buried collection lines would result in some temporary effects to native and non-native grasslands. Any temporary impacts to native prairie will be offset by reseeding using a National Resources Conservation Service/Farm Service Agency-approved seed mix in accordance with landowner preferences. Other temporarily disturbed areas will be reseeded or restored to crop, depending on original conditions and landowner preference.

8.0 TIER 4: POST-CONSTRUCTION STUDIES TO ESTIMATE IMPACTS

8.1 Carcass Surveys

Brady Wind will conduct standardized post-construction fatality monitoring for one year following construction (Appendix B). The objective of the fatality monitoring is to identify the bird and bat species found as fatalities at the Project and to statistically estimate fatality rates. The monitoring framework consists of standardized carcass searches conducted at a sample of the Project turbines. The number of fatalities found during searches represents a minimum number of fatalities at a project because not all fatalities that occur are found by observers. Therefore,

carcass persistence trials and searcher efficiency trials will be conducted concurrently with standardized fatality monitoring to account for the bias attributable to carcass removal by scavengers and searcher efficiency. Fatality rates (e.g., birds/turbine/year and birds/operational MW/year) will then be estimated using statistical methods that adjust the number of carcasses found for detection biases. Per-turbine and per-MW estimates provide different ways of scaling fatality information to be comparable to other projects. Annual fatality rates will be calculated for all bird species combined, small (less than or equal to 10 inches) and large (greater than10 inches) birds, raptors, and sensitive species (collectively). For further information on this protocol, see Appendix B: Post Construction Fatality Monitoring.

Any incident involving a whooping crane or other federally listed species will be promptly reported to the USFWS North Dakota Ecological Services Field Office (701-250-4481) and NDGF (701-328-6300) by the Wildlife Program Manager (see Appendix C). Any carcass of a federally protected species will be covered with a weighted container until it is recovered by a responding field agent. A kit containing the materials necessary for the protocol will be provided in the operations and maintenance building.

8.1.1 Project Permits Addressing Birds and Bats

To collect, transport, and temporarily possess migratory birds found as fatalities on properties that generate electricity, a USFWS Special Purpose Utility permit must be obtained. Additionally, a state scientific collection permit from NDGF is required to kill, take, or possess wildlife and their parts when conducting research or for other scientific purposes, including education and information.

Brady Wind will not collect any fatalities detected at the Project during post-construction monitoring. As a result, Brady Wind will not obtain permits for scientific collecting purposes. Should injured or downed wildlife be detected within the Project Area, reporting will occur as described in the Wildlife Response and Reporting System (WRRS). With the exception of special-status species (species protected under the ESA, BGEPA, or state listing), fatalities detected will be thoroughly documented and left in place.

8.2 Other Surveys

8.2.1 Wildlife Response and Reporting System

In addition to the carcass surveys, a standard protocol called the WRRS is used at all NextEra Energy wind energy facilities. The purpose of the WRRS is to standardize the actions taken in response to any wildlife fatalities and/or injuries found within the Project's boundaries. Personnel will be trained to follow the search procedure and fill out the reporting form. Wildlife surveys/inspections will be completed each time a turbine is visited. For further information on this protocol, see Appendix C: Wildlife Response and Reporting System.

9.0 TIER 5: OTHER POST-CONSTRUCTION STUDIES AND ADAPTIVE MANAGEMENT

The United States Department of Interior defines adaptive management as a decision-making process that promotes flexible decision making and adjustment of management decisions as information is collected (Williams et al. 2007). Brady Wind has adopted an adaptive management approach to assessing and responding to the impacts of its wind energy facility on birds and bats. Brady Wind is committed to adaptively managing impacts to birds and bats for the life of the Project. Based on experience from the operating wind farms in the region, significant unanticipated impacts to species of concern are not expected. In the event that the Brady Wind detects a significant unanticipated impact, such as mortality or injury to a federally listed species or higher than expected migratory bird or bat mortality for the region, Brady Wind will contact the USFWS North Dakota Field Office to discuss additional potential avoidance, minimization, or mitigation measures to be considered. Brady Wind is committed to developing an approach that facilitates understanding any unanticipated significant issues and collaboratively working with the USFWS to develop additional avoidance, minimization, or mitigation measures that may be appropriate.

10.0 REPORTING FORMATS AND SCHEDULE

10.1 Pre-Construction Survey Data

Pre-construction survey data has been, and will continue to be compiled and analyzed in a report for each survey and/or survey season. Reports are in standard scientific format or in memorandum format, as appropriate based on the amount of data collected. Reports have been and will be submitted to USFWS and NDGF.

10.2 Post-Construction Mortality Reporting

A post-construction fatality monitoring report will be prepared for the one year of surveys conducted to summarize avian and bat fatalities associated with operations of the Project. This report will include a detailed summary of the methods; results from carcass searches, carcass persistence trials, and searcher efficiency trials; an estimate of fatalities on a per-turbine and per-MW basis; and discussions of the results in the context of adaptive management. The report will be provided to USFWS and NDGFD by the end of the first quarter following completion of one year of post-construction monitoring.

10.3 Personnel Training

Brady Wind will develop a site-specific worker environmental training program that will be administered to all employees and contractors working in the field during construction. The training will be implemented to inform workers of the biological resources present on-site to minimize wildlife impacts. All employees and contractors working in the field will be required to attend the general environmental training session and a whooping crane-specific training prior to working on-site. This training includes information regarding identification of the sensitive biological resources, restrictions, protection measures, individual responsibilities associated with the Project, and the consequences of non-compliance. Written material will be provided to employees at orientation and participants will sign an attendance sheet documenting their participation. The training will be performed by qualified consultants or in-house environmental staff qualified to conduct the training.

11.0 DECOMMISSIONING

The Project is anticipated to have a lifetime of up to 30 years after which it may no longer be cost-effective to continue operations. The Project will then be decommissioned, and the existing equipment removed. At that time, a Decommissioning Plan will be prepared in accordance with NDCC 49-02-27, NDAC 69-09-09, and Stark County Ordinance 6.19.7. Additionally, Brady Wind has a contractual obligation to the landowners to remove the wind facilities, including foundations to a depth of three feet below ground, when the wind easement expires and to restore the area to the same physical condition that existed immediately before the construction of the turbines. Brady Wind also reserves the right to explore alternatives regarding Project decommissioning at the end of the Project Certificate term. For example, retrofitting the turbines and power system with upgrades based on new technology may allow the wind farm to produce efficiently and successfully for many more years.

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Tables

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Table 1. Chronology of Resource Agency Contact for the Project

Date	Purpose	Contacts
May 15, 2015	*Request* email to NDGF: Inquiry regarding known locations of eagles nests within 10 miles of the proposed project boundary. **Response received June 10, 2015.**	Sandy Johnson NDGF, Conservation Biologist Bismarck, ND
June 10, 2015	*Response* email from NDGF (re: May 15, 2015) regarding any known eagle nest location within 10-miles of the Project Area.	Sandy Johnson (NDGF)
August 14, 2015	*Request* letter to USFWS: Inquiry regarding sensitive resources. **No response received.**	Kevin Shelley Acting ND Supervisor, USFWS Bismarck, ND
August 14, 2015	*Request* letter to NDGF: Inquiry regarding sensitive resources. **Response received September 25, 2015.**	Terry Steinwand NDGF Bismarck, ND
August 14, 2015	*Request* letter to NDPRD: Inquiry regarding sensitive resources. **Response received August 31, 2015.**	Mark Zimmerman NDPRD Bismarck, ND
August 31, 2015	*Response* letter from NDPRD (re: August 14, 2015 letter) stating the approximate location of known significant ecological communities and sensitive plant and wildlife occurrences within the vicinity of the Project.	Kathy Duttenhefner Coordinator, Natural Resources Division Bismarck, ND
September 25, 2015	*Response* letter from NDGF (re: August 14, 2015 letter) recommending that Brady Wind follow the USFWS Wind Energy Guidelines, that unavoidable wetlands be replaced in kind, that overhead lines are marked, that aerial surveys for raptor nests be conducted prior to construction, that active eagles nests are avoided by ½ mi buffer during construction, and that routine mortality monitoring is conducted for the life of the Project.	Greg Link NDGF Conservation and Communication Division Bismarck, ND
November 23, 2015	*Request letter* asking to setup meeting with USFWS.	Kevin Shelley (USFWS)
November 30, 2015	*Request letter,* second attempt, asking to setup meeting with USFWS.	Kevin Shelley (USFWS)
December 14, 2015	*Request email* included material to facilitate agency meeting on December 16.	Kevin Shelley (USFWS) and John Schumacher (NDGF)
December 16, 2015	*Meeting* in Bismarck with USFWS and NDGF to discuss sensitive wildlife resources.	Kevin Shelley (USFWS) and John Schumacher (NDGF)
January 11, 2016	*Request* email to USFWS: Inquiry regarding presence of USFWS easements or fee-title lands in or near Project Area. **Response email received January 20, 2016.**	Susan Kvas, Supervisory Fish and Wildlife Biologist USFWS, Bismarck, ND
January 11, 2016	*Request* email follow-up to voice mail request to NDGF for locations of prairie dog colonies and burrowing owls in Project Area. **Response email received January 20, 2016.**	Sandy Johnson (NDGF)
January 11, 2016	*Request* email to NDGF for sage grouse locations and other known grouse or lek locations	Aaron Robinson Upland Game Management

Table 1. Chronology of Resource Agency Contact for the Project

Date	Purpose	Contacts
	in Project Area. **Response email received February 3, 2016.**	Supervisor, NDGF Dickinson, ND
January 11, 2016	*Response* email to USFWS (unknown date): Inquiry regarding known Dakota skipper occurrences. Shape files sent to USFWS. No occurrence of designated Dakota skipper critical habitat within the Project Area	Kevin Shelley (USFWS)
January 20, 2016	*Response* email (re: January 11, 2016) from USFWS to inquiry on presence of USFWS easements or fee-title lands stating there are no USFWS easements or fee-title lands within or near the proposed Project Area.	Susan Kvas (USFWS)
January 20, 2016	*Response* email from NDGF (Re: January 11, 2016 email) providing GIS files of prairie dog colonies and burrowing owl locations to Brady Wind.	Sandy Johnson (NDGF)
January 20, 2016	*Response* email from USFWS (Re: January 11, 2016 email) confirming that there are no USFWS land interests within the Brady Project Area or within 10 miles.	Sue Kvas (USFWS)
January 26, 2016	*Request* email: GIS files and maps of native prairie and forest habitats provided to USFWS and NDGF to review for Dakota skipper, whooping crane, and Sprague's pipit occurrences. **Response email received January 26, 2016 and discussion February 26, 2016.**	Kevin Shelley (USFWS) and John Schumacher (NDGF)
January 26, 2016	*Response* email received stating that received attachments.	Kevin Shelley (USFWS) and John Schumacher (NDGF)
January 29, 2016	*Request* email: WCS outline sent to USFWS for input. **Response email received February 3, 2016.**	Kevin Shelley (USFWS)
February 3, 2016	*Response* email from NDGF (re: January 11, 2016) request for information regarding sage grouse locations: The Project Area does not overlap with NDGF grouse census blocks. NDGF recommends that the agency help design a survey protocol for grouse habitat.	Aaron Robinson (NDGF)
February 3, 2016	*Response* email (re: January 29, 2016) from USFWS on edits to WCS outline and recommendations.	Kevin Shelley (USFWS)
February 4, 2016	*Response* email (re: January 29 and February 3, 2016) to USFWS asking if data crosschecked because of upcoming hearing.	Kevin Shelley (USFWS)
February 4, 2016	*Discussion* with NDGF regarding spring 2016 lek surveys.	Aaron Robinson (NDGF)
February 8, 2016	*Discussion* with USFWS regarding Wildlife Conservation Strategy (WCS) outline and content.	Kevin Shelley (USFWS)
February 8, 2016	*Request* email: Proposed lek protocol and survey route sent to NDGF for review	Aaron Robinson (NDGF)

Table 1. Chronology of Resource Agency Contact for the Project

Date	Purpose	Contacts
February 18, 2016	*Request* email: Hardcopies of desktop whooping crane and bat assessments, as well as fall eagle use survey, raptor nest surveys, fall avian surveys, native prairie assessment, and bat acoustic monitoring reports sent to USFWS and NDGF.	Kevin Shelley (USFWS) and John Schumacher (NDGF)
February 26, 2016	*Discussion* of grouse species and overall prairie habitat conservation interests of USFWS and NDGF.	Kevin Shelley (USFWS) and Aaron Robinson (NDGF)
March 2, 2016	*Request* email to NDGF for review of grouse survey protocol and survey route. **Response email received March 9, 2016.**	Aaron Robinson (NDGF)
March 9, 2016	*Request* email Follow-up request to NDGF for comments on lek survey protocol. **Response email received March 9, 2016.**	Aaron Robinson (NDGF)
March 9, 2016	*Response* from NDGF (re: March 2, 2016) comments and edits to protocol were provided, and included listening stations every ½ mile.	Aaron Robinson (NDGF)
March 28, 2016	Request Voicemail and email to USFWS to follow-up on documents sent 2/18/2016	Kevin Shelley (USFWS)
March 28, 2016	Response to email from USFWS that a review of documents had not yet been done	Kevin Shelley (USFWS)
April 5, 2016	*Request* to NDGF for updated eagle nest shapefiles **Response email received April 13, 2016.**	Sandy Johnson (NDGF)
April 5, 2016	*Request* to USFWS requesting to discuss golden eagles. **Response email received April 5, 2016.**	Kevin Shelley (USFWS)
April 11, 2016	*Response* emails back and forth from USFWS and NextEra (re: April 5 and April 11, 2016) regarding meeting coordination and new golden eagle nest.	Kevin Shelley (USFWS)
April 13, 2016	*Response* from NDGF (re: April 5, 2016) regarding shapefiles from March 29-31 aerial nest surveys sent to NDGF.	Sandy Johnson (NDGF)
April 18, 2016	*Email discussion:* NDGF notified Tetra Tech about a new raptor nest in Project Area (46.62939N, 102.710975W). **Response email received April 21, 2016.**	Sandy Johnson (NDGF)
April 21, 2016	Tetra Tech report to NDGF (re: April 18, 2016) that nest reported on 4/18/16 was occupied by a red-tailed hawk.	Sandy Johnson (NDGF)
April 28, 2016	*Request* to USFWS and NDGF regarding Raptor Nest Survey Report, Grouse Lek Survey Report, and Spring Avian Report sent to USFWS and NDGF.	Kevin Shelley (USFWS) and John Schumacher (NDGF) and Aaron Robinson (NDGF)
May 3, 2016	*Request* to NDGF for sharp-tailed grouse lek buffer recommendations. **Response email received May 19, 2016.**	Aaron Robinson (NDGF)
May 19, 2016	*Response* from NDGF (re: May 13, 2016) stating that sharp-tailed grouse recommendations were being worked on.	Aaron Robinson (NDGF)

Table 1. Chronology of Resource Agency Contact for the Project

Date	Purpose	Contacts
July 29, 2016	*Discussion:* NDGF notified Tetra Tech that sharp-tailed grouse lek buffer recommendations would not be made until further research was done.	Aaron Robinson (NDGF)

GIS – Geographic Information System
NDGF – North Dakota Game and Fish
NDPRD – North Dakota Parks and Recreation Department
WCS – Wildlife Conservation Strategy
USFWS – U.S. Fish and Wildlife Service

Table 2. Land Cover Types at the Project (NLCD)

Land Use/ Land Cover Description	Acres in Project Area	Percent of Project Area
Cultivated Crops	16,447	54.8
Grasslands/Herbaceous	7,452	24.8
Pasture/Hay	4,296	14.3
Developed, Open Space	1,195	3.9
Developed, Low Intensity	20	Less than 0.1
Developed, Medium Intensity	2	Less than 0.1
Shrub/Scrub	273	0.9
Woody Wetlands	213	0.7
Deciduous Forest	29	Less than 0.1
Emergent Herbaceous Wetlands	21	Less than 0.1
Evergreen Forest	2	Less than 0.1
Open Water	30	Less than 0.1
Barren Land (Rock/Sand/Clay)	4	Less than 0.1
Total	**29,983**	

Source: Jin et al. 2013

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Table 3. Species and Average Counts for the NDME Christmas Bird Count from 2005–2014

Species Group	Average Count/Year
Songbirds	
American Robin	248.0
Cedar Waxwing	61.3
American Goldfinch	39.2
Common Redpoll	33.6
Bohemian Waxwing	28.6
Black-capped Chickadee	26.4
Black-billed Magpie	25.3
House Sparrow	24.7
European Starling	8.4
Dark-eyed Junco (Slate-colored)	7.5
Townsend's Solitaire	7.5
Horned Lark	7.0
American Tree Sparrow	6.5
White-breasted Nuthatch	6.0
Lapland Longspur	4.3
Northern Shrike	3.3
Pine Siskin	2.5
American Crow	2.3
Purple Finch	1.9
House Finch	1.7
Snow Bunting	1.1
Dark-eyed Junco (Oregon)	0.5
Red-winged Blackbird	0.4
Harris's Sparrow	0.2
Common Grackle	0.1
Hoary Redpoll	0.1
Loggerhead Shrike[2]	0.1
Red-breasted Nuthatch	0.1
Waterfowl	
Common Merganser	0.4
Gamebirds	
Wild Turkey	37.4
Sharp-tailed Grouse	22.7
Gray Partridge	1.6
Doves/Pigeons	
Rock Pigeon	4.4
Mourning Dove	0.3
Raptors	
Golden Eagle[2]	8.7
Red-tailed Hawk	5.0

Table 3. Species and Average Counts for the NDME Christmas Bird Count from 2005–2014

Species Group	Average Count/Year
Bald Eagle[2]	3.6
Rough-legged Hawk	3.3
Great Horned Owl	2.3
Northern Saw-whet Owl	1.5
Prairie Falcon	0.8
Eastern Screech-Owl	0.6
Northern Goshawk	0.6
American Kestrel	0.4
Cooper's Hawk	0.4
Northern Harrier	0.4
Merlin	0.3
Red-tailed Hawk (Harlan's)	0.2
Sharp-shinned Hawk	0.2
Buteo sp.	0.1
Falcon sp.	0.1
Long-eared Owl	0.1
Short-eared Owl[2]	0.1
Woodpeckers	
Hairy Woodpecker	3.8
Downy Woodpecker	3.8
Northern Flicker (Red-shafted)	0.6
Northern Flicker (Yellow-shafted)	0.4
Northern Flicker (intergrade)	0.1
Red-bellied Woodpecker	0.1

Source: National Audubon Society. 2010.

1 Average number of individuals counted / year.

2 USFWS Bird of Conservation Concern, Region 17 (USFWS 2008a).

Table 4. Species Encountered and Their Abundance on the Dickinson Breeding Bird Survey Route

Species Group	Birds/Route[1]	Preferred Habitat
Songbirds		
Western Meadowlark	118.44	shrub/woodlands
Horned Lark	114.15	wetlands/open areas
Lark Bunting	111.88	shrub/open areas
Red-winged Blackbird	79.26	grasslands/agriculture
Brown-headed Cowbird	57.12	grasslands
Common Grackle	17.50	grasslands/agriculture
Grasshopper Sparrow[2]	17.24	grasslands/agriculture
American Robin	15.56	agriculture/wetlands
Chestnut-collared Longspur[2]	14.82	grasslands/agriculture
Eastern Kingbird	14.71	wetlands
House Sparrow	13.21	grasslands/agriculture
Bank Swallow	10.06	grasslands/agriculture
Bobolink	9.00	grasslands/agriculture
Savannah Sparrow	8.62	grasslands/agriculture
Western Kingbird	8.21	shrub/woodlands
Barn Swallow	7.91	grasslands/agriculture
Common Yellowthroat	4.12	shrub/agriculture
Vesper Sparrow	3.71	shrub/woodlands
American Crow	3.26	cliffs/open areas
Yellow Warbler	3.26	grasslands
American Goldfinch	2.94	grasslands/agriculture
House Wren	2.59	grasslands/agriculture
Clay-colored Sparrow	2.56	grasslands/agriculture
Brown Thrasher	2.53	grasslands
Brewer's Blackbird	2.35	shrub/wetlands
European Starling	2.06	shrub/grasslands
Cliff Swallow	1.82	grasslands/agriculture
Loggerhead Shrike[2]	1.47	grasslands/agriculture
Black-billed Magpie	1.21	grasslands/agriculture
Yellow-headed Blackbird	0.97	shrub/woodlands
Baird's Sparrow	0.76	grasslands/agriculture
Lark Sparrow	0.74	grasslands/agriculture
Alder & Willow Flycatcher	0.56	grasslands
Orchard Oriole	0.56	grasslands/agriculture

Table 4. Species Encountered and Their Abundance on the Dickinson Breeding Bird Survey Route

Species Group	Birds/Route[1]	Preferred Habitat
Song Sparrow	0.56	shrub/woodlands
Willow Flycatcher	0.56	shrub/woodlands
Field Sparrow	0.50	grasslands/agriculture
Northern Rough-winged Swallow	0.50	shrub/woodlands
Warbling Vireo	0.47	shrub/woodlands
Cedar Waxwing	0.32	grasslands/agriculture
Gray Catbird	0.32	shrub/woodlands
Great Blue Heron (all forms)	0.24	wetlands
Say's Phoebe	0.24	grassland
Baltimore Oriole	0.21	grasslands/agriculture
Black-capped Chickadee	0.21	grasslands/agriculture
Chipping Sparrow	0.21	grasslands/agriculture
Dickcissel	0.21	wetlands
Tree Swallow	0.21	shrub/woodlands
Sprague's Pipit[2]	0.15	grasslands
Spotted Towhee	0.09	grasslands
Western Wood-Pewee	0.09	open woodland
Least Flycatcher	0.06	shrub/woodlands
Blue Jay	0.03	grasslands/agriculture
Bullock's Oriole	0.03	open woodland
Great Crested Flycatcher	0.03	open woodland
Lazuli Bunting	0.03	forests
Mountain Bluebird	0.03	open woodland
Sedge Wren	0.03	shrub/woodlands
Veery	0.03	forests
Gulls/Terns		
Ring-billed Gull	0.35	wetlands
Waterfowl		
Mallard (all forms)	8.76	wetlands
Blue-winged Teal	0.74	wetlands
Northern Pintail	0.32	wetlands
Canada Goose	0.26	wetlands
American Wigeon	0.09	wetlands
Gadwall	0.09	wetlands
Northern Shoveler	0.06	wetlands

Table 4. Species Encountered and Their Abundance on the Dickinson Breeding Bird Survey Route

Species Group	Birds/Route[1]	Preferred Habitat
Green-winged Teal	0.03	wetlands
Redhead	0.03	wetlands
Waterbirds		
Double-crested Cormorant	0.09	wetlands
American Bittern[2]	0.03	wetlands
Cranes/Rails		
American Coot	0.09	wetlands
Sora	0.06	wetlands
Shorebirds		
Killdeer	13.88	wetlands
Upland Sandpiper	2.21	wetlands
Wilson's Snipe	1.00	wetlands
Marbled Godwit[2]	0.44	wetlands
Wilson's Phalarope	0.21	wetlands
Spotted Sandpiper	0.06	wetlands
Willet	0.03	wetlands
Gamebirds		
Ring-necked Pheasant	50.53	grasslands/agriculture
Gray Partridge	1.97	grasslands/agriculture
Wild Turkey	1.38	grasslands/agriculture
Sharp-tailed Grouse	0.94	grasslands/agriculture
Doves/Pigeons		
Mourning Dove	41.00	shrub/open areas
Rock Pigeon	2.44	urban areas
Raptors		
Northern Harrier	2.62	grasslands
Swainson's Hawk	1.15	grasslands/agriculture
American Kestrel	0.56	shrub/grasslands/open areas
Short-eared Owl[2]	0.26	grasslands/agriculture
Great Horned Owl	0.26	grasslands/agriculture
Burrowing Owl	0.15	grasslands
Ferruginous Hawk[2]	0.06	grasslands
Red-tailed Hawk (all forms)	0.09	grasslands/agriculture
Prairie Falcon	0.03	shrub/grasslands/open areas
Others		

Table 4. Species Encountered and Their Abundance on the Dickinson Breeding Bird Survey Route

Species Group	Birds/Route[1]	Preferred Habitat
Belted Kingfisher	0.35	wetlands
Common Nighthawk	0.12	grasslands
Black-billed Cuckoo[2]	0.06	shrub/woodlands
Woodpeckers		
Red-headed Woodpecker[2]	0.18	open woodland
Hairy Woodpecker	0.03	forests

Source: Sauer et al. 2014

1. These numbers reflect the abundance of the species near the survey route. They are averages of the total counts along the route for the period 1989-1998. Because each survey route is 24.5 mi long, and consists of 50, 3 minute counts along the length of the route, the abundance estimate represents the number of birds that a biologist would encounter in about 2.5 hours of roadside birding in the area near the BBS route.
2. USFWS Bird of Conservation Concern, Region 17 (USFWS 2008a).

Table 5. USFWS BCC for BCR 17

Species	Residency Status Near Project Area/Notes	Detected in Vicinity of Project Area during CBC or BBS Surveys
Horned Grebe	Non-breeder – migrant	No
American Bittern	Breeder – summer resident	BBS
Bald Eagle	Breeder and migrant. ESA Delisted; Bald and Golden Eagle Protection Act	CBC
Golden Eagle	Breeder, possible year-round resident. Bald and Golden Eagle Protection Act	CBC
Ferruginous Hawk	Breeder- summer resident	BBS
Peregrine Falcon	Non-breeder – migrant. ESA Delisted	No
Prairie Falcon	Non-breeder – winter resident	No
Yellow Rail	Summer resident (rare)	No
Mountain Plover	Project outside of its range	No
Upland Sandpiper	Breeder – summer resident	
Long-billed Curlew	Breeder – summer resident (rare)	No
Marbled Godwit	Breeder – summer resident	BBS
Black-billed Cuckoo	Breeder – summer resident	BBS
Burrowing Owl	Breeder – summer resident	BBS
Short-eared Owl	Breeder – year-round resident	CBC, BBS
Lewis's Woodpecker	Rare	No
Red-headed Woodpecker	Breeder – summer resident	BBS
Loggerhead Shrike	Breeder – summer resident	CBC, BBS
Pinon Jay	Rare	No
Sage Thrasher	Rare	No
Sprague's Pipit	Breeder – summer resident	BBS
Brewer’s Sparrow	Project outside of its range	No
Sage Sparrow	Project outside of its range	No
Baird’s Sparrow	Breeder – summer resident	No
Grasshopper Sparrow	Breeder – summer resident	BBS
McCown's Longspur	Rare	No
Chestnut-collared Longspur	Breeder – summer resident	BBS
Dickcissel	Breeder – summer resident	No
Sources: USFWS 2008a; Sibley 2003 (residency status)		

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Table 6. Summary of Survey Efforts To-Date at the Project

Study (Report)	Focus	Survey Type	Dates Conducted
2015 Summer Raptor Nest Survey	All Raptors	Ground-based	June 10-11, 2015
2015 Fall Avian Survey	Birds, eagles	20-minute point counts	August 20 – November 4, 2015
2015/2016 Eagle Use Survey	Eagles	60-minute point counts	August 20, 2015 – April 2016
2015 Late Summer/Fall Bat Surveys	Bats	Acoustic	July – November 2015
2015 Fall Raptor Nest Surveys	All Raptors	Aerial	November 17-18, 2015
2015 Native Prairie Assessment	Native Prairie	Desktop and field survey	August 2015 (Revised December 2015)
2016 Winter Raptor Nest Survey	Eagles	Aerial	January 25-27, 2016 February 24, 2016
2016 Spring Avian Survey	All Birds	20-minute point counts	March 18 through June 8, 2016
2016 Eagle Nest Monitoring and Prey-base Surveys	Eagles	Eagle nest watches (up to 4 hours each)	January through April 2016
2016 Prey Base Surveys	Deer, Pronghorn, and Prairie Dogs	Aerial	Four flights: Two each in March and April 2016.
2016 Spring Raptor Nest Surveys	All Raptors	Aerial and ground-based	Aerial survey March 29-30, 2016, ground survey May 15-16, 2016
2016 Spring Grouse Lek Surveys	Sharp-tailed grouse, greater sage grouse	Ground-based	Two rounds in April 2016 conducted between April 6 and 12 and April 25 and 29.

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Table 7. Dakota Skipper Habitat within the Project Area

Classification	Field Verified (Acres and Number of Polygons)	Desktop Assessment Only (Acres and Number of Polygons)	Total (Acres and Number of Polygons)	Percent of Proposed Project Area
Excellent/Likely Habitat	375 acres 2 polygons	None	375 acres 2 polygons	1
Good/Possible Habitat	2,475 acres 9 polygons	585 acres 5 polygons	3,060 acres 14 polygons	10
Poor/Unlikely Habitat	437 acres 7 polygons	291 acres 13 polygons	728 acres 20 polygons	2
Undetermined	410 acres 6 polygons	1,522 acres 16 polygons	1,931 acres 22 polygons	6

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Table 8. Eagle Nests and Large Stick Raptor Nests at Brady Wind Energy Center, North Dakota, June 2015 – March 2016

Nest ID Number	Species	Sub-strate	Size Category	Status on June 10-11, 2015	Status on November 17-18, 2015	Status on January 25-27, 2016	Status on February 24, 2016	Status on March 29-31, 2016	Distance to Nearest Turbine (miles)**	Nearest Turbine**	Comments
2015_10	Unknown	Tree	Large	Unknown	Unoccupied	Unoccupied	Not checked	Unoccupied	2.0	16	Nest may have been built up recently as nest size was recorded as small in November. Appears to be a ferruginous hawk nest based on the nest height and size of nest tree.
2015_11	Unknown	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	Unoccupied	2.7	4	
2015_12	Unknown	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	Unoccupied	2.8	4	
2015_13	Unknown	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	Occupied	2.7	4	Fresh lining material in the nest, but species undetermined
2015_14	Unknown	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	Unoccupied	3.7	4	
2015_15	Unknown	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	Occupied	3.9	4	Fresh lining material in the nest, but species undetermined
2015_18	Unknown	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	Unoccupied	6.1	5	
2015_19	Bald Eagle	Tree	Large	Outside Survey Area	Outside Survey Area	Occupied	Occupied	Occupied	9.0	80	Adult on nest incubating.
2015_20	Bald Eagle	Tree	Large	Outside Survey Area	Outside Survey Area	Occupied	Occupied	Occupied	3.3	79	Adult on nest incubating.
2015_21	Golden Eagle	Cliff	Large	Outside Survey Area	Outside Survey Area	Not found	Unoccupied	Unoccupied	9.5	1	NDGF Nest GE099.
2015_22	Golden Eagle	Cliff	Large	Outside Survey Area	Outside Survey Area	Gone	Gone	Gone*	8.6	4	NDGF Nest GE100; reported as destroyed by NDGF.
2015_23	Golden Eagle	Cliff	Large	Outside Survey Area	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	9.5	1	NDGF Nest GE098.
2015_24	Golden Eagle	Cliff	Large	Outside Survey Area	Outside Survey Area	Not found	Unoccupied	Unoccupied	9.3	4	NDGF Nest GE101.
2015_25	Ferruginous Hawk	Cliff	Large	Outside Survey Area	Outside Survey Area	Unoccupied	Unoccupied	Occupied	8.6	4	NDGF Nest GE576: extremely tall nest visible from several miles away.
2015_26	Golden Eagle	Cliff	Large	Outside Survey Area	Outside Survey Area	Gone	Gone	Gone*	9.5	1	NDGF Nest GE097; reported as destroyed by NDGF.
2016_02	Unknown	Tree	Large	Outside Survey Area	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	13.3	60	Newly documented in January 2016.
2016_07	Ferruginous Hawk	Cliff	Large	Outside Survey Area	Outside Survey Area	Unoccupied	Unoccupied	Occupied	9.2	1	Newly documented in January 2016. Nest on a sandstone pillar.

Table 8. Eagle Nests and Large Stick Raptor Nests at Brady Wind Energy Center, North Dakota, June 2015 – March 2016

Nest ID Number	Species	Sub-strate	Size Category	Status on June 10-11, 2015	Status on November 17-18, 2015	Status on January 25-27, 2016	Status on February 24, 2016	Status on March 29-31, 2016	Distance to Nearest Turbine (miles)**	Nearest Turbine**	Comments
2016_08	Golden Eagle	Tree	Large	Outside Survey Area	Outside Survey Area	Unoccupied	Occupied	Occupied	8.0	32	Fresh lining material in the nest in February. Adult on nest incubating in March.
2016_09	Golden Eagle	Tree	Large	Outside Survey Area	Outside Survey Area	Unoccupied	Occupied	Occupied	12.3	40	Fresh lining material in the nest in February. Adult on nest incubating in March.
2016_10	Unknown	Tree	Large	Outside Survey Area	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	3.0	77	Newly documented in January 2016. Located approximately 800 feet from Nest 2015_20; appears to be an alternate bald eagle nest.
2016_13	Unknown	Tree	Large	Outside Survey Area	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	8	32	Alternate nest in same group of trees as Nest 2016_08.
2016_12	Unknown	Tree	Large	Outside Survey Area	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	8.0	32	Alternate nest in same group of trees as Nest 2016_08.
2016_15	Unknown	Tree	Large	Outside Survey Area	Outside Survey Area	Not found	Not checked	Unoccupied	10.3	10	
2016_16	Unknown	Tree	Large	Outside Survey Area	Outside Survey Area	Not found	Not checked	Unoccupied	10.3	10	
2016_17	Ferruginous Hawk	Tree	Large	Outside Survey Area	Outside Survey Area	Not found	Not checked	Occupied	2.5	19	
2016_21	Unknown	Tree	Large	Outside Survey Area	Outside Survey Area	Not found	Unoccupied	Unoccupied	10	80	
2015_38	Unknown	Tree	Large	Outside Survey Area	Unoccupied	Not found	Not checked	Unoccupied	2.5	16	
2015_39	Golden Eagle	Tree	Small	Outside Survey Area	Outside Survey Area	Unoccupied	Not checked	Occupied	2.4	51	Not a typical eagle nest, relatively small and located near the top of the tree; resembles a medium to fairly large non-eagle raptor nest. Hence, the nest was not checked during the one day February survey to check occupancy of known or suspected eagle nests.

*These nests are not included in Figure 9a because they are no longer present.
**The distance to the nearest turbine and nearest turbine number are based on the turbine array dated April 4, 2016.

Table 9. Eagle Mean Inter-nest Distances at the Project

Nests Included in Analysis	Bald Eagle	Golden Eagle
Known eagle nests within 10 miles of Project Area	8.0 miles	0.8 miles
Known eagle nests and other large stick nests within 10 miles of Project Area	3.0 miles	3.0 miles

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Table 10. Federally or State-Protected and BCC Species Observed during Avian Surveys at the Project

Species	BCC Region 17 Listing	State SCP Listing	USFWS Habitat Fragment-ation Concern[1]	Avian Survey[2]				Total
				Summer 2015	Fall 2015	Winter 2015/2016	Spring 2016	
Songbirds								
Grasshopper sparrow	Yes	Level I	Yes	0	0	0	1	1
Upland sandpiper	No	Level II	Yes	0	0	0	1	1
Western meadowlark	No	Level II	No	0	237	n/a	349	586
Raptors								
Northern harrier	No	Level II	Yes	0	51	0	56	107
Swainson's hawk	No	Level I	No	7	80	0	59	146
Bald eagle	Yes	Level II	No	0	1	7	4	12
Ferruginous hawk	Yes	Level I	No	0	1	0	0	1
Golden eagle	Yes	Level II	No	0	13	18	2	33
Prairie falcon	Yes	Level II	No	0	0	0	1	1
Grouse								
Sharp-tailed grouse	No	Level II	Yes	0	49	0	11	60

n/a – not applicable. Species was not surveyed.
1. North Dakota Field Office (USFWS 2013b).
2. Numbers of birds detected include those observed during surveys and those observed incidentally.

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Table 111. Summary of Acoustic Bat Monitoring Surveys at the Project

Detector	Level of Effort		Call Sequence Summary		
	Operational Period (2015)	Detector-Nights	Total # of Bat Calls	Min, Max	Mean Activity Rate (bat calls/detector night) (sd)
1	July 22 - December 3	135	21,516	0, 1561	159.4 (31)
2	July 22 - December 3	135	204	0, 57	1.5 (5.1)
3	July 22 - December 3	135	1,635	0, 125	12.1 (19.7)
4	July 22 - December 3	135	2,226	0, 250	16.5 (29.3)
Overall[1]		**540**	**25,581**	**0, 1561**	**47.4 (24.3)**

1. Represents cumulative values for detector nights and total number of calls and the pooled range and activity rates across all detectors in the Project Area.

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Table 122. Average Activity Rates (Bat Calls/Detector Night) Recorded per Species at each Detector

Detector	Big brown bat	Eastern red bat	Hoary bat	Silver-haired bat	Little brown bat	Myotis Species	High frequency sp.	Site Total
1	0.3	10.7	0.1	0.8	147.3	0.1	0.2	159.4
2	0.0	0.2	0.1	0.2	1.0	0.0	0.0	1.5
3	1.1	1.5	0.2	3.4	5.9	0.1	0.0	12.1
4	0.8	5.1	0.5	1.9	8.1	0.1	0.0	16.5
Overall	**0.6**	**4.4**	**0.2**	**1.6**	**40.5**	**<0.1**	**0.1**	**47.4**

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Table 133. Estimated Mean Bird Fatalities for all Birds per Turbine and per Megawatt at Wind Facilities in the Midwest

Wind Facility	State	Habitat	Estimated mean bird fatality/ turbine/year	Estimated mean bird fatality/ MW/year	Source
Blue Sky Green Field	WI	Agricultural Cropland	11.83	7.17	Gruver et al. 2009
Buffalo Ridge Phase I (1996-1999)	MN	Agricultural Cropland	0.98	2.86	Johnson et al. 2000
Forward Energy	WI	Agricultural Cropland	3.27	2.18	Grodsky and Drake 2011
Kewaunee County	WI	Agricultural Cropland	1.29	1.95	Howe et al. 2002
Ainsworth	NE	Mixed grass prairie	2.68	1.63	Derby et al. 2007
Summerview	AB Canada	Mixed grass prairie	1.9	-	Brown and Hamilton 2006
Red Canyon	TX	Short-grass prairie	0.77	0.50	Miller 2008
Top of Iowa	IA	Agricultural cropland	0.44 (2003) 0.96 (2004)	0.49 (2003) 1.07 (2004)	Jain 2005 Jain et al. 2011
Buffalo Gap II	TX	Mixed-grass prairie	0.22	0.15	Tierney 2009
Regional Mean (90-percent confidence interval)			**2.43 (1.80)**	**2.00 (1.17)**	

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Table 144. Estimated Mean Bat Fatalities per Turbine and per Megawatt at Wind Facilities in the Midwest

Wind Facility and State	State	Habitat	Estimated Mean Fatalities/ Turbine/Year	Estimated Mean Fatalities/ MW/Year	Documented Bat Species Fatalities[1]	Source
Red Canyon	TX	Short-grass prairie	71.8	46.1	Brazilian free-tailed bat, hoary bat, eastern red bat	Miller 2008
Blue Sky Green Field	WI	Agricultural Cropland	40.54	24.57	Little brown, silver-haired, big brown, hoary, eastern red, and unidentified	Gruver et al. 2009
Forward Energy	WI	Agricultural Cropland	23.44	15.63	Hoary, silver-haired, eastern red, unknown, little brown, big brown	Grodsky and Drake 2011
Kewaunee County	WI	Agricultural Cropland	4.26	6.45	Eastern red and hoary.	Howe et al. 2002
Top of Iowa	IA	Agricultural cropland	4.45 (2003) 7.14 (2004)	4.94 (2003) 7.94 (2004)	Hoary, little brown, eastern red, big brown, silver-haired	Jain 2005, Jain et al. 2011
Ainsworth	NE	Mixed-grass prairie	1.91	1.16	Hoary, unidentified species, big brown and eastern red	Derby et al. 2007
Buffalo Gap II	TX	Mixed-grass prairie	0.21	0.41	Hoary bat, Brazilian free-tailed bat, unidentified species	Tierney 2009
Summerview	AB Canada	Mixed-grass prairie	18.48	-	Hoary, silver-haired, little brown, big brown, eastern red	Brown and Hamilton 2006
Buffalo Ridge Phase I (1996-1999)	MN	Agricultural Cropland	0.26	-	Hoary, eastern red, silver-haired, tricolored,	Johnson et al. 2000
Regional Mean (90-percent Confidence Interval)			**17.25 (12.05)**	**13.4 (9.00)**	**-**	

1. In order of decreasing frequency.

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Table 15. Pre-Construction Survey Reports and Submittal Dates

Report	Date Submitted
2015 Fall Avian Survey	February 18, 2016
Native Prairie Habitat Evaluation	February 18, 2016
Bat Habitat Assessment	February 18, 2016
Whooping Crane Likelihood of Occurrence Report	February 18, 2016
Bat Acoustic Survey Report	February 18, 2016
Eagle Use Report, August 2015 – February 2016	February 18, 2016
Raptor Nest Survey Report February 2016	February 18, 2016
Raptor Nest Survey Report March 2016	April 28, 2016
Grouse Lek Survey Report	April 28, 2016
Spring Avian Report (through March 2016)	April 28, 2016
Spring 2016 Avian Report (avian use, lek, and raptor nest surveys though June 2016)	September 2016
Spring 2016 Eagle Report (eagle use, prey-based surveys, and eagle watches)	August 2016

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Figures

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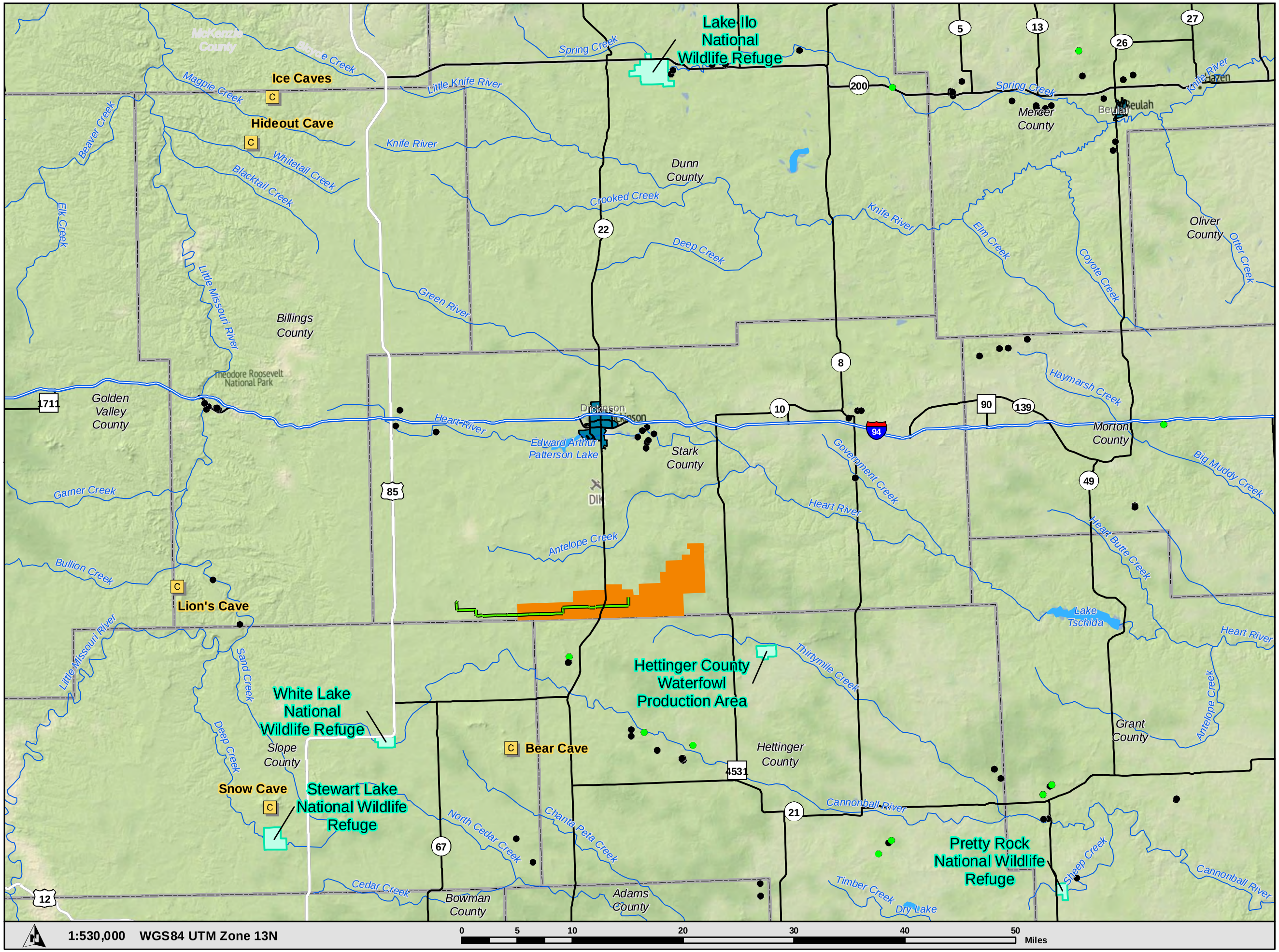

Figure 1

Project Location

Brady Wind Energy Center

Stark County, ND

- Proposed Project Area (10-21-2015)
- Proposed Transmission Line (02-02-2016)
- National Wildlife Refuge
- State Boundary
- County Boundary
- Urban area
- Interstate Highway
- Secondary Highway
- Secondary Road
- River/Stream
- Lake/Pond
- Approximate Cave Location

Abandoned Mines

- Underground
- Underground/ Surface

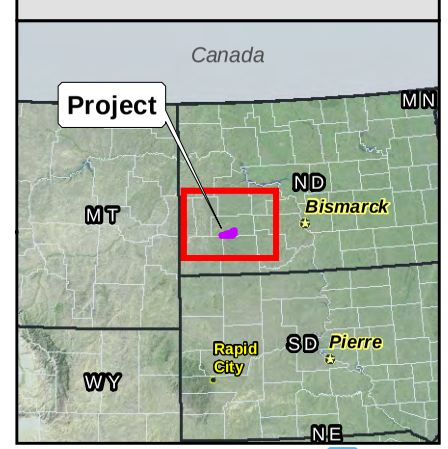

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Figure 2

Project Layout

Brady Wind Energy Center

Stark County, ND

- Proposed Turbine (06-03-16)
- Proposed Alternate Turbine (06-03-16)
- Proposed Temporary Met Tower (11-11-2015)
- Proposed Permanent Met Tower (11-11-2015)
- Proposed Collection Line (06-07-2015)
- Proposed Service Roads (06-13-2016)
- Proposed Transmission Line (02-02-2016)
- Proposed O&M Bldg (08-13-2015)
- Proposed Substation (08-13-2015)
- Proposed Switchyard (08-13-2015)
- Proposed Project Area (10-21-2015)

1:110,000 WGS84 UTM Zone 13N

0 0.5 1 2 3 4 5 Miles

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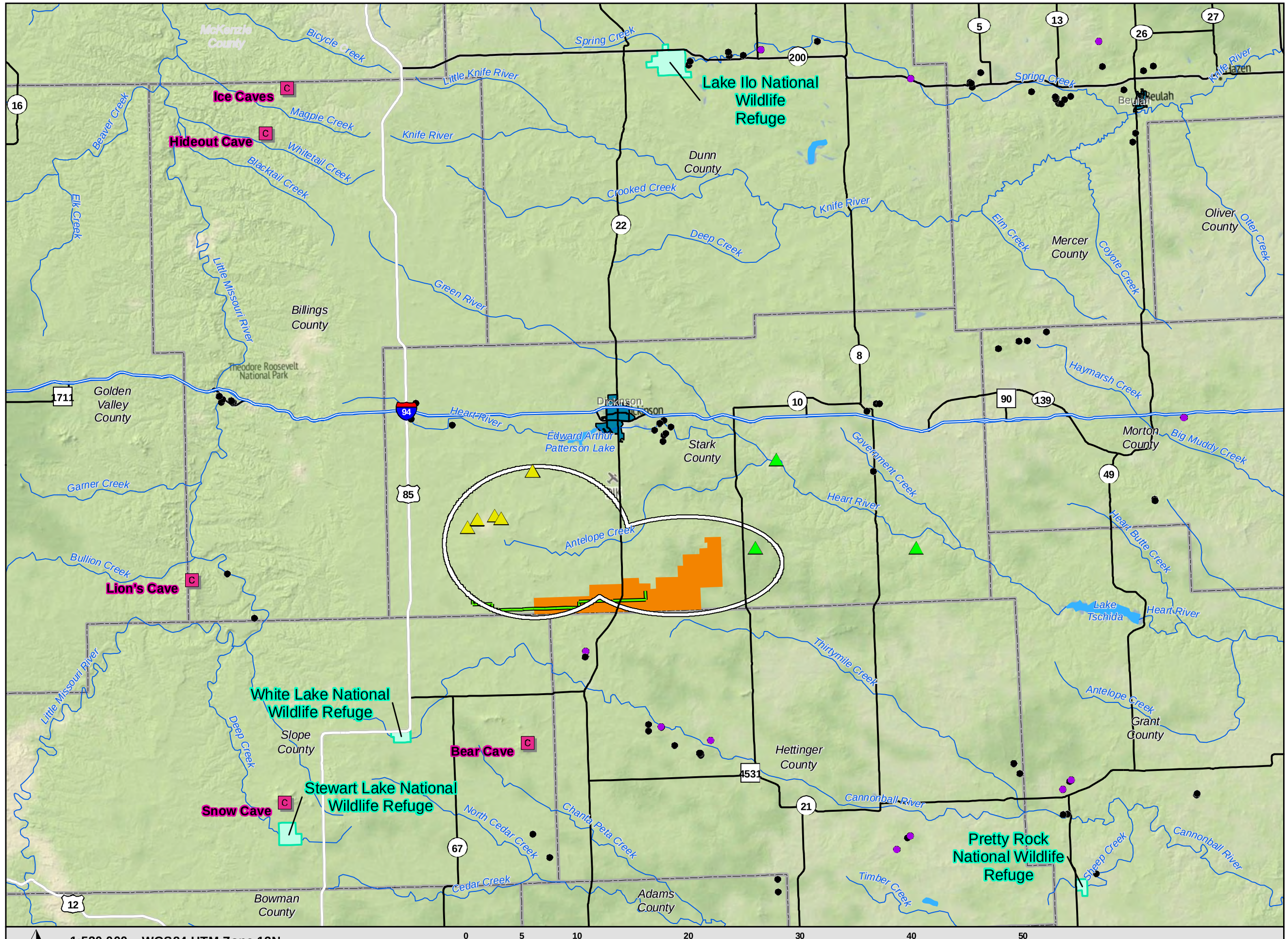

1:530,000 WGS84 UTM Zone 13N

0 5 10 20 30 40 50 Miles

Figure 3

Tier 1 and Tier 2 Evaluation Areas

Brady Wind Energy Center

Stark County, ND

- USFS WEG Tier 1 Evaluation Area
- USFWS WEG Tier 2 Evaluation Area (Current Project Boundary)
- Bald Eagle Nest (Tetra Tech--Spring 2015)
- Golden Eagle Nests (North Dakota Fish and Game - Spring 2015)
- National Wildlife Refuge
- Approximate Cave Location

Abandoned Mines

- Underground
- Underground/ Surface

- State Boundary
- County Boundary
- Urban area
- Interstate Highway
- Proposed Transmission Line (02-02-2016)
- Secondary Highway
- Secondary Road
- River/Stream
- Lake/Pond

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Figure 4

Land Cover

Brady Wind Energy Center

Stark County, ND

Proposed Project Area (10-21-2015)

Proposed Transmission Line (02-02-2016)

Land Cover Type

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/ Herbaceous
- Hay/Pasture
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

1:120,000 WGS84 UTM Zone 13N

0 0.5 1 2 3 4 5 Miles

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Figure 5

Prey Distribution

Brady Wind Energy Center

Stark County, ND

Prey-based Species (Number Observed)

- Pronghorn
- Deer
- Proposed Project Area (10-21-2015)
- Aerial Prey-base Survey Area (2-mile Buffer Around Project Boundary)
- Proposed Transmission Line (02-02-2016)
- Parcels with Cattle Present (01-27-16)
- NDGFD Active Prairie Dog Towns as of March 2016
- Active Prairie Dog Towns as of March 2016

1:150,000 WGS84 UTM Zone 13N

0 0.5 1 2 3 4 5 Miles

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Figure 6

Whooping Crane Migration: North Dakota

Brady Wind Energy Center

Stark County, ND

Proposed Project Area (10-21-2015)

35-mile Buffer

State Boundary

County Boundary

Percentage of Sightings Within the Whooping Crane Migration Corridor

75%

80%

85%

90%

95%

Montana

North Dakota

North Dakota

South Dakota

1:1,500,000 WGS84 UTM Zone 13N

0 5 10 20 30 40 50 Miles

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Figure 7a

Dakota Skipper Habitat

NEXTera ENERGY RESOURCES

Brady Wind Energy Center

Stark County, ND

Proposed Project Area (10-21-2015)

Proposed Transmission Line (02-02-2016)

Desktop Habitat Assessment Only

Good/Potential Dakota Skipper Habitat

Not Surveyed

Field Verified Dakota Skipper Habitat

Excellent/Likely

Good/Possible

1:120,000 WGS84 UTM Zone 13N

0 0.5 1 2 3 4 5 Miles

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Figure 7b

Dakota Skipper Habitat and Project Infrastructure

NEXTera ENERGY RESOURCES

Brady Wind Energy Center

Stark County, ND

- Proposed Project Area (10-21-2015)
- Proposed Turbine (06-03-16)
- Proposed Alternate Turbine (06-03-16)
- Proposed Temporary Met Tower (11-11-2015)
- Proposed Permanent Met Tower (11-11-2015)
- Proposed Collection Line (06-07-2015)
- Proposed Service Roads (06-13-2016)
- Proposed O&M Bldg (08-13-2015)
- Proposed Substation (08-13-2015)

Desktop Habitat Assessment Only

- Good/Potential Dakota Skipper Habitat
- Not Surveyed

Field Verified Dakota Skipper Habitat

- Excellent/Likely
- Good/Possible

1:82,000 WGS84 UTM Zone 13N

0 0.5 1 2 3 4 5 Miles

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Figure 8

Avian Point-Count and Bat Detector Location Map

Brady Wind Energy Center

Stark County, ND

PC 01
PC 02
PC 03
PC 04
PC 05
PC 06
PC 07
PC 08
PC 09
PC 10
PC 11
PC 12
PC 13
PC 14
PC 15
PC 16
PC 17
PC 18
PC 19
PC 20
PC 21
PC 22
PC 23
1
2
3
4

1:120,000 WGS84 UTM Zone 13N

0 0.5 1 2 3 4 5 Miles

- Bat Detector Location
- Current Avian Survey Point
- Current Avian Survey Point 800-meter Radius
- Historic Avian Survey Point
- Historic Avian Survey Point 800-m Radius
- Proposed Transmission Line (02-02-2016)
- Original Proposed Project Boundary (05-28-2015)
- Proposed Project Area (10-21-2015)

PC# Point count number

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Figure 9a

Raptor Nest Location Map (Summer/Fall 2015, Winter/Spring 2016)

Brady Wind Energy Center

Stark County, ND

- Occupied Golden eagle Nest
- Occupied Bald eagle Nest
- Occupied Ferruginous hawk Nest
- Occupied Swainson's hawk Nest
- Occupied Great horned owl Nest
- Occupied Red-tailed hawk Nest
- Unoccupied Small Stick Nest
- Occupied Large Stick Nest, Species Undetermined
- Unoccupied Large Stick Nest
- Proposed Transmission Line (02-02-2016)
- Proposed Project Area (10-21-2015)
- Survey Area 2-mile Buffer
- Survey Area 10-mile Buffer

1:218,000 WGS84 UTM Zone 13N

0 0.5 1 2 3 4 5 Miles

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Figure 9b

Raptor Nest Locations and Project Infrastructure

Brady Wind Energy Center

Stark County, ND

2015_18
2015_15
2015_11
2015_13
2015_10
2015_38
2016_30
2016_31
2016_20
2016_39
2015_05
2016_22
2016_06
2015_04
2015_03
2016_03
2016_05
2015_02
2015_16
2016_04
2015_17
2016_24
2015_07
2016_37
2016_36
2015_06
2015_09
2016_18
2016_17
2015_39

- Occupied Golden eagle Nest
- Occupied Ferruginous hawk Nest
- Occupied Swainson's hawk Nest
- Occupied Great horned owl Nest
- Occupied Red-tailed hawk Nest
- Occupied Large Stick Nest, Species Undetermined
- Unoccupied Small Stick Nest
- Unoccupied Large Stick Nest
- Proposed Turbine (06-03-16)
- Proposed Alternate Turbine (06-03-16)
- Proposed Temporary Met Tower (11-11-2015)
- Proposed Permanent Met Tower (11-11-2015)
- Proposed Collection Line (06-07-2015)
- Proposed Service Roads (06-13-2016)
- Proposed Transmission Line (02-02-2016)
- Proposed O&M Bldg (08-13-2015)
- Proposed Substation (08-13-2015)
- Proposed Project Area (10-21-2015)
- Survey Area 2-mile

1:82,000 WGS84 UTM Zone 13N

0 0.5 1 2 3 4 5 Miles

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TETRA TECH

Figure 10

2015/2016 Incidental Eagle Observations

Brady Wind Energy Center

Stark County, ND

Incidental Eagle Observations During Eagle Use and Raptor Nest Surveys

- Bald Eagle
- Golden Eagle
- Golden Eagle Flight Path below 200m
- Proposed Transmission Line (02-02-2016)
- Proposed Project Area (10-21-2015)
- Survey Area 10-mile Buffer

1:220,000 WGS84 UTM Zone 13N

0 0.5 1 2 3 4 5 Miles

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Figure 11

Raptor Nest Buffers During Construction

Brady Wind Energy Center

Stark County, ND

- Occupied Swainson's hawk Nest
- Occupied Great horned owl Nest
- Occupied Red-tailed hawk Nest
- Raptor Nest Construction Buffers
- Proposed Turbine (06-03-16)
- Proposed Alternate Turbine (06-03-16)
- Proposed Temporary Met Tower (11-11-2015)
- Proposed Permanent Met Tower (11-11-2015)
- Proposed Collection Line (06-07-2015)
- Proposed Service Roads (06-13-2016)
- Proposed Transmission Line (02-02-2016)
- Proposed O&M Bldg (08-13-2015)
- Proposed Substation (08-13-2015)
- Proposed Project Area (10-21-2015)

1:82,000 WGS84 UTM Zone 13N

0 0.5 1 2 3 4 5 Miles

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Appendix A: Copies of Agency Consultation

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TETRA TECH

August 14, 2015

Mr. Kevin Shelley
Acting ND Field Supervisor
USFWS North Dakota Field Office
3425 Miriam Avenue
Bismarck, ND 58501-7926

Subject: **Information Request for the Proposed Brady Wind Energy Center in Hettinger and Stark Counties, ND**

Dear Mr. Shelley:

Tetra Tech has been contracted by NextEra Energy Resources, LLC to prepare an application for a Certificate of Site Compatibility for the proposed Brady Wind Energy Center (the Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07. As part of that application, we are conducting an investigation of property in Hettinger and Stark counties south of the city of Dickinson. This proposed Project would consist of approximately 150 megawatts (MW). The Project area shown in the attached figure is the primary focus of our investigation.

The Project would interconnect to the electrical grid via a 230-kV transmission line approximately 17 miles in length from the Project substation to the Belfield to Rhame 230-kV line approximately 20 miles southwest of the city of Dickinson. We will also prepare a separate application for a Certificate of Corridor Compatibility and Route Permit for the proposed transmission line.

The wind energy center would include portions of the following tracts:

County	Township	Range	Sections
Hettinger	136 N	96 W	3-9, 15-18
Hettinger	136 N	97 W	1-6, 8-13
Stark	137 N	95 W	1, 2, 9-16, 19-24, 27-34
Stark	137 N	96 W	23-36
Stark	137 N	97 W	25-29, 32-36

Tetra Tech, Inc.
8911 N. Capital of Texas Hwy, Bldg 2 Suite #2310, Austin, TX 78759
Tel 512.338.1667 Fax 512.338-1331 tetratech.com

The associated transmission line corridor includes the following tracts:

County	Township	Range	Sections
Hettinger	136 N	96 W	2-6
Hettinger	136 N	97 W	1-6
Slope	136 N	98 W	1-6
Slope	136 N	99 W	1-3
Stark	137 N	95 W	18-20, 29-32
Stark	137 N	96 W	11-36
Stark	137 N	97 W	13-36
Stark	137 N	98 W	13-36

Per Section 69-06-01-05 of the North Dakota Public Service Commission (PSC)'s administrative rules, we are consulting your agency for assistance in identifying concerns or issues within the boundaries of the tracts listed below that would influence a decision regarding the use of the land, as well as applicable permits that may be required from your office.

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers, State Historical Society of North Dakota, and North Dakota Game and Fish Department (NDGF).

NextEra Energy is developing the Project following the voluntary Final Land-Based Wind Energy Guidelines. Desktop habitat analyses for bats and whooping crane are underway as part of Tier 1 and Tier 2 assessments for the Project. Tier 3 assessments that are currently planned or underway for the Project include fall and spring avian migration surveys, biweekly eagle use surveys, raptor nest and grouse lek surveys, and bat acoustic monitoring.

We requested documented eagle nest locations in the vicinity of the Project Area from the NDGF in May 2015 and conducted a ground-based summer nest inventory in June 2015. There are no documented eagle nests within 3 miles of the Project Area. There is one occupied bald eagle nest approximately 3 miles east of the Project Area; one active and three inactive golden eagle nests are located approximately 7 miles from the Project Area.

We would appreciate a response by September 30, 2015. Please contact me at (512) 213-8501 if you have any questions. Thank you for your assistance.

Respectfully submitted,

Anne-Marie Griger, AICP

TETRA TECH

August 14, 2015

Mr. Terry Steinwand
Director
North Dakota Game and Fish Department
100 N. Bismarck Expressway
Bismarck, ND 58501-5095

Subject: **Information Request for the Proposed Brady Wind Energy Center in Hettinger and Stark Counties, ND**

Dear Mr. Steinwand:

Tetra Tech has been contracted by NextEra Energy Resources, LLC to prepare an application for a Certificate of Site Compatibility for the proposed Brady Wind Energy Center (the Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07. As part of that application, we are conducting an investigation of property in Hettinger and Stark counties south of the city of Dickinson. This proposed Project would consist of approximately 150 megawatts (MW). The Project area shown in the attached figure is the primary focus of our investigation.

The Project would interconnect to the electrical grid via a 230-kV transmission line approximately 17 miles in length from the Project substation to the Belfield to Rhame 230-kV line approximately 20 miles southwest of the city of Dickinson. We will also prepare a separate application for a Certificate of Corridor Compatibility and Route Permit for the proposed transmission line.

The wind energy center would include portions of the following tracts:

County	Township	Range	Sections
Hettinger	136 N	96 W	3-9, 15-18
Hettinger	136 N	97 W	1-6, 8-13
Stark	137 N	95 W	1, 2, 9-16, 19-24, 27-34
Stark	137 N	96 W	23-36
Stark	137 N	97 W	25-29, 32-36

Tetra Tech, Inc.
8911 N. Capital of Texas Hwy, Bldg 2 Suite #2310, Austin, TX 78759
Tel 512.338.1667 Fax 512.338-1331 tetratech.com

The associated transmission line corridor includes the following tracts:

County	Township	Range	Sections
Hettinger	136 N	96 W	2-6
Hettinger	136 N	97 W	1-6
Slope	136 N	98 W	1-6
Slope	136 N	99 W	1-3
Stark	137 N	95 W	18-20, 29-32
Stark	137 N	96 W	11-36
Stark	137 N	97 W	13-36
Stark	137 N	98 W	13-36

Per Section 69-06-01-05 of the North Dakota Public Service Commission (PSC)'s administrative rules, we are consulting your agency for assistance in identifying concerns or issues within the boundaries of the tracts listed below that would influence a decision regarding the use of the land, as well as applicable permits that may be required from your office.

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers, State Historical Society of North Dakota, and North Dakota Game and Fish Department (NDGF).

NextEra Energy is developing the Project following the voluntary Final Land-Based Wind Energy Guidelines. Desktop habitat analyses for bats and whooping crane are underway as part of Tier 1 and Tier 2 assessments for the Project. Tier 3 assessments that are currently planned or underway for the Project include fall and spring avian migration surveys, biweekly eagle use surveys, raptor nest and grouse lek surveys, and bat acoustic monitoring.

We requested documented eagle nest locations in the vicinity of the Project Area from the NDGF in May 2015 and conducted a ground-based summer nest inventory in June 2015. There are no documented eagle nests within 3 miles of the Project Area. There is one occupied bald eagle nest approximately 3 miles east of the Project Area; one active and three inactive golden eagle nests are located approximately 7 miles from the Project Area.

We would appreciate a response by September 30, 2015. Please contact me at (512) 213-8501 if you have any questions. Thank you for your assistance.

Respectfully submitted,

Anne-Marie Griger, AICP

TETRA TECH

August 14, 2015

Mr. Mark Zimmerman
Director
North Dakota Parks and Recreation Department
1600 E. Century Ave, Suite 3
Bismarck, ND 58503

Subject: **Information Request for the Proposed Brady Wind Energy Center in Hettinger and Stark Counties, ND**

Dear Mr. Zimmerman:

Tetra Tech has been contracted by NextEra Energy Resources, LLC to prepare an application for a Certificate of Site Compatibility for the proposed Brady Wind Energy Center (the Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07. As part of that application, we are conducting an investigation of property in Hettinger and Stark counties south of the city of Dickinson. This proposed Project would consist of approximately 150 megawatts (MW). The Project area shown in the attached figure is the primary focus of our investigation.

The Project would interconnect to the electrical grid via a 230-kV transmission line approximately 17 miles in length from the Project substation to the Belfield to Rhame 230-kV line approximately 20 miles southwest of the city of Dickinson. We will also prepare a separate application for a Certificate of Corridor Compatibility and Route Permit for the proposed transmission line.

The wind energy center would include portions of the following tracts:

County	Township	Range	Sections
Hettinger	136 N	96 W	3-9, 15-18
Hettinger	136 N	97 W	1-6, 8-13
Stark	137 N	95 W	1, 2, 9-16, 19-24, 27-34
Stark	137 N	96 W	23-36
Stark	137 N	97 W	25-29, 32-36

Tetra Tech, Inc.
8911 N. Capital of Texas Hwy, Bldg 2 Suite #2310, Austin, TX 78759
Tel 512.338.1667 Fax 512.338-1331 tetratech.com

Mr. Zimmerman
North Dakota Parks and Recreation Department
August 14, 2015

The associated transmission line corridor includes the following tracts:

County	Township	Range	Sections
Hettinger	136 N	96 W	2-6
Hettinger	136 N	97 W	1-6
Slope	136 N	98 W	1-6
Slope	136 N	99 W	1-3
Stark	137 N	95 W	18-20, 29-32
Stark	137 N	96 W	11-36
Stark	137 N	97 W	13-36
Stark	137 N	98 W	13-36

Per Section 69-06-01-05 of the North Dakota Public Service Commission (PSC)'s administrative rules, we are consulting your agency for assistance in identifying concerns or issues within the boundaries of the tracts listed below that would influence a decision regarding the use of the land, as well as applicable permits that may be required from your office.

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and North Dakota Game and Fish Department.

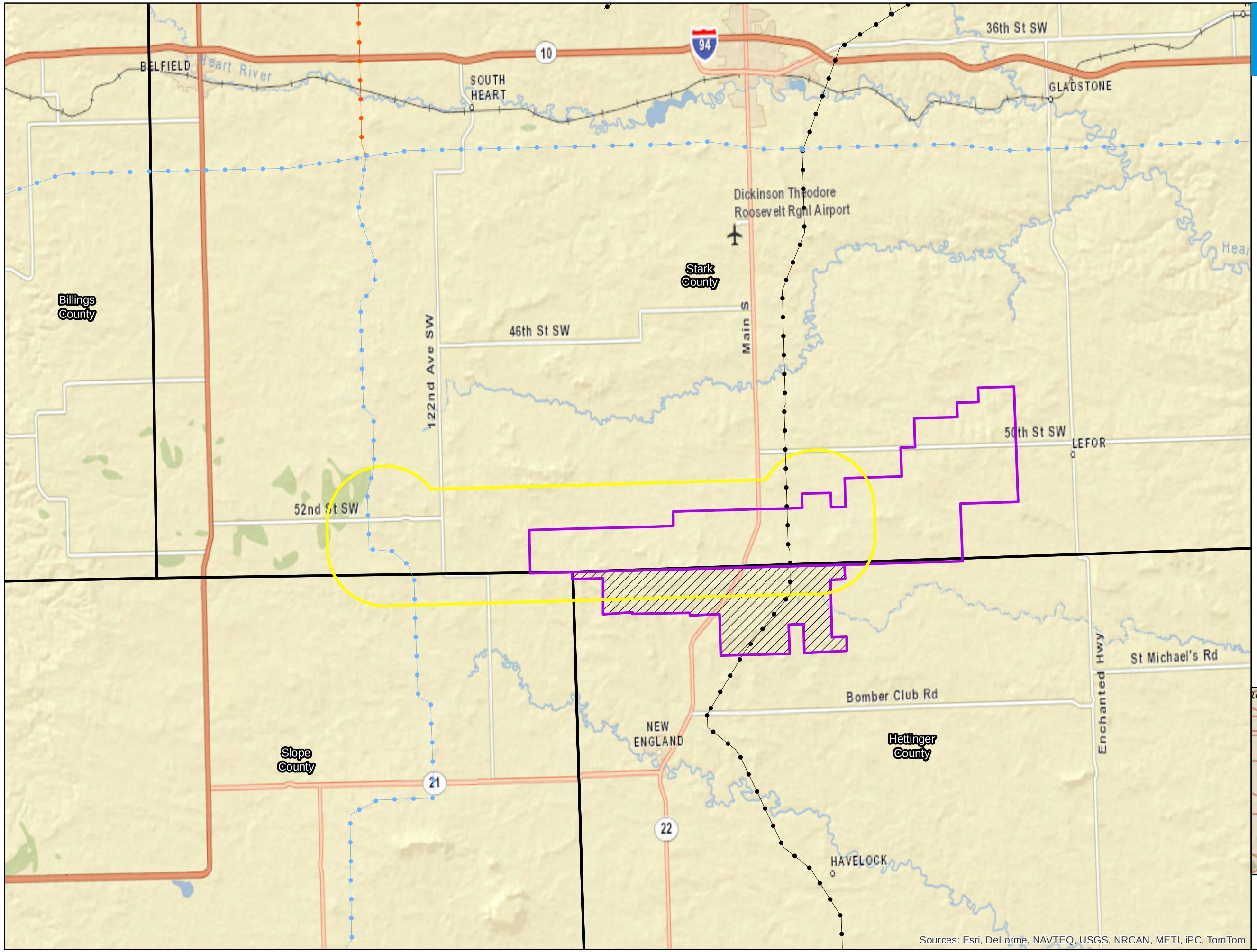
We would appreciate a response by September 30, 2015. Please contact me at (512) 213-8501 if you have any questions. Thank you for your assistance.

Respectfully submitted,

Anne-Marie Griger, AICP

Brady Wind Energy Center North Dakota

Project Location



Legend

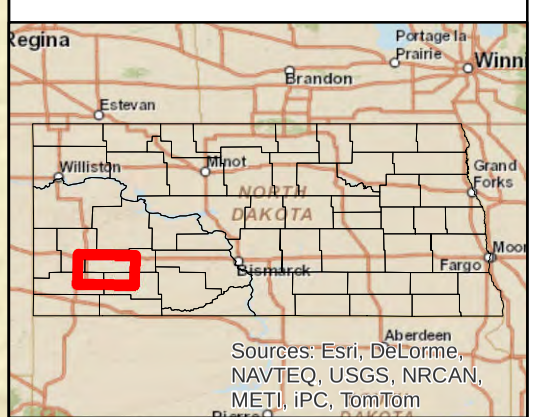
- Transmission Line Corridor
- Project Boundary
- Additional Area Under Consideration
- County Boundary

Existing Electrical Transmission

- 115kV Transmission Line
- 230kV Transmission Line
- 345kV Transmission Line

0 1.5 3 6

Miles



NEXTera ENERGY RESOURCES

Path: T:\GIS\NextEra\Brady\MXD\Project Location.mxd

"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

September 25, 2015

Anne-Marie Griger, AICP
Tetra Tech, Inc.
8911 N. Capital of Texas Hwy
Bldg. 2, Suite #2310
Austin, TX 78759

Dear Ms. Griger:

RE: Proposed Brady Wind Energy Center
Hettinger & Stark Counties, North Dakota

The North Dakota Game and Fish Department has reviewed this project for wildlife concerns.

A primary concern with wind power development is the disturbance of native prairie associated with construction of turbines, access roads, and other associated facilities. We ask that work within native prairie be avoided to the extent possible. This could include micro-siting turbines onto adjacent previously disturbed land, locating access roads on existing section line trails rather than across undisturbed native prairie, etc. We also suggest the US Fish and Wildlife Service Land-Based Wind Energy Guidelines be implemented as appropriate during the development of this project.

The National Wetland Inventory indicates various wetlands located within the proposed project area. We recommend that any unavoidable wetland impacts be replaced in kind, above-ground appurtenances not be placed in wetland areas, and no alterations be made to existing drainage patterns.

We ask that collection lines be buried whenever possible, and any necessary overhead lines be marked when placed over perennial streams or sited in close proximity to wetland complexes to minimize possible avian impacts. The publication "Reducing Avian Collisions with Power Lines: the State of the Art in 2012" provides a range of management options which can be used to reduce avian losses.

Aerial surveys should be conducted for raptor nests before construction begins. A ½-mile construction buffer should be implemented around active eagle nest sites (known occupied

within the past 5 years). Ms. Sandra Johnson, Conservation Biologist, can be contacted at 701-328-6327 for additional information on eagle nest sites in the state.

We also recommend that routine monitoring for avian and bat mortality be included as part of the facility maintenance plan for the life of the project. We would appreciate being kept informed as this project progresses, and if possible, we would like the GPS coordinates for each turbine after the site has been established.

Sincerely,

Greg Link
Chief
Conservation & Communication Division

js

Jack Dalrymple, Governor
Mark A. Zimmerman, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@nd.gov
www.parkrec.nd.gov

August 31, 2015

Ms. Anne-Marie Griger
Tetra Tech, Inc
Bldg 2 Suite #2310
8911 N. Capital of Texas Hwy.
Austin, TX 78759

Re: Proposed Brady Wind Energy Center in Hettinger and Start Counties

Dear Ms. Griger,

The North Dakota Parks and Recreation Department (the Department) has reviewed the above referenced proposed Brady Wind Energy Center in Hettinger and Stark Counties.

Our agency scope of authority and expertise covers recreation and biological resources (in particular rare plants and ecological communities). The project as defined does not affect state park lands that we manage or affect state Land and Water Conservation Fund (LWCF) project sites that we manage.

The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, we several plant, and animal species of concern and significant ecological communities documented within sections and in adjacent sections to project area. Please see the attached spreadsheet and map for more information on these occurrences.

Because this information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. Regarding any reclamation efforts, we recommend that any impacted areas be revegetated with species native to the project area.

It is our policy to charge requests for data services including data retrieval, data analysis, manual and computer searches, packaging and collection of data. An invoice for services provided has been enclosed.

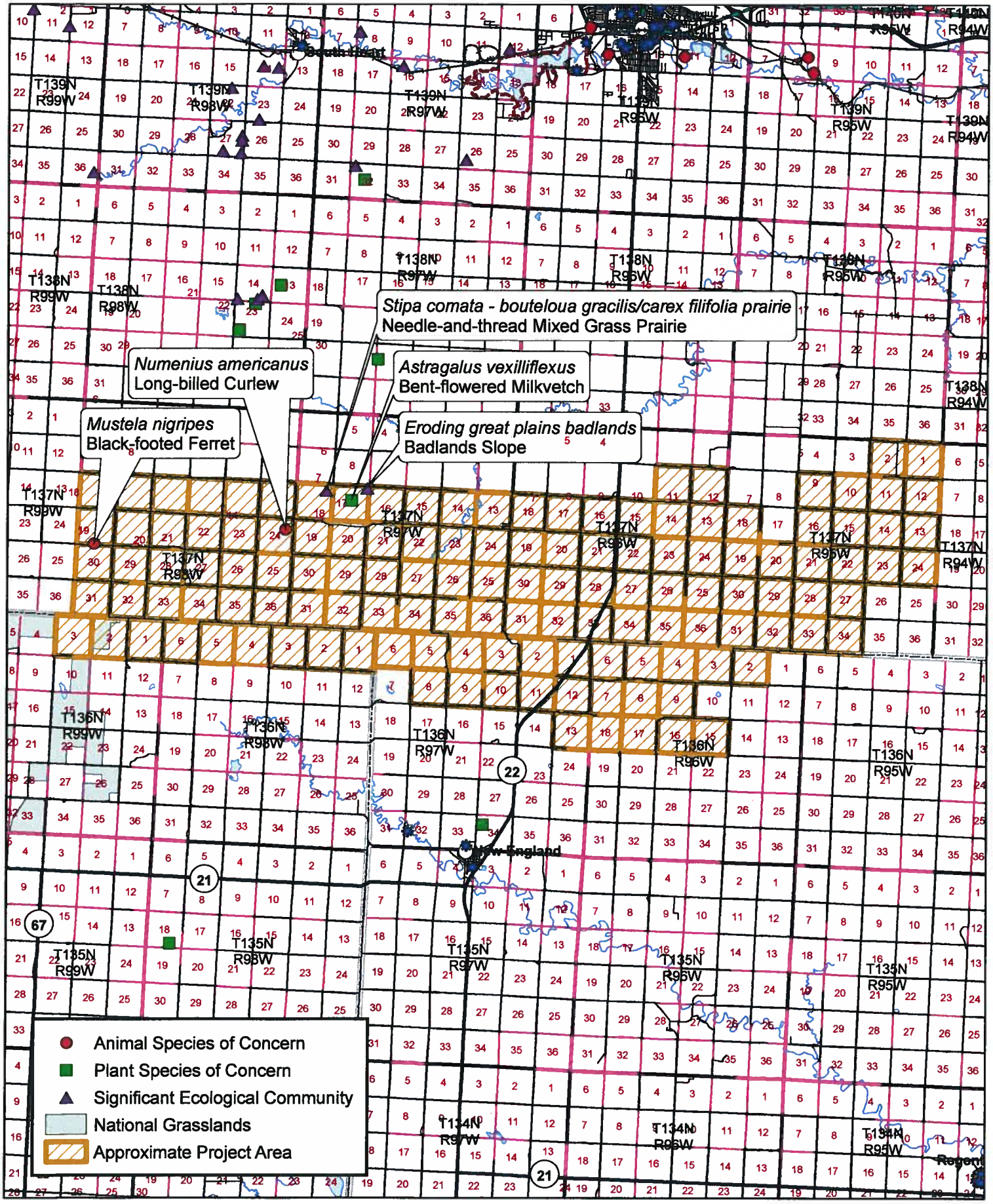
We appreciate your commitment to rare plant, animal and ecological community conservation, management and inter-agency cooperation to date. For additional information please contact Kathy Duttenhefner (701-328-5370 or kgduttenhefner@nd.gov) of our staff. Thank you for the opportunity to comment on this proposed project.

Sincerely,

Kathy Duttenhefner, Coordinator
Natural Resources Division

R.USNDNHI*2015_079KD18.31.2015DL8.31.2015

North Dakota Parks and Recreation Department
North Dakota Natural Heritage Inventory



August 2015

North Dakota Natural Heritage Inventory
Rare Animal and Plant Species and Significant Ecological Communities

State Scientific Name	State Common Name	State Rank	Global Rank	Federal Status	Township Range Section	County	Last Observation	Estimated Representation Accuracy	Precision
Astragalus vexilliflexus	Bent-flowered Milkvetch	S3	G4		137N097W - 17	Stark	1985-09-18		S
Eroding great plains badlands	Badlands Slope	S4	GNR		137N097W - 08; 137N097W - 16; 137N097W - 17	Stark	1985-09-18		S
Mustela nigripes	Black-footed Ferret	S1	G1	LE,XN	137N099W - 36; 137N098W - 29; 137N098W - 17; 137N098W - 31; 137N098W - 32; 137N098W - 30; 137N099W - 13; 137N099W - 25; 137N098W - 18; 137N099W - 24; 137N098W - 19; 137N098W - 20	Stark	1976	Low	M
Numenius americanus	Long-billed Curlew	S2	G5		137N098W - 24	Stark	1976-05		S
Stipa comata - bouteloua gracilis/carex filifolia prairie	Needle-and-thread Mixed Grass Prairie	S2	GNR		137N097W - 18	Stark	1985-09-18		S

North Dakota Natural Heritage Inventory Biological and Conservation Data Disclaimer

The quantity and quality of data collected by the North Dakota Natural Heritage Inventory are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in North Dakota have never been thoroughly surveyed, and new species are still being discovered. For these reasons, the Natural Heritage Inventory cannot provide a definite statement on the presence, absence, or condition of biological elements in any part of North Dakota. Natural Heritage data summarize the existing information known at the time of the request. Our data are continually upgraded and information is continually being added to the database. This data should never be regarded as final statements on the elements or areas that are being considered, nor should they be substituted for on-site surveys.

Estimated Representation Accuracy

Value that indicates the approximate percentage of the Element Occurrence Representation (EO Rep) that was observed to be occupied by the species or community (versus buffer area added for locational uncertainty). Use of estimated representation accuracy provides a common index for the consistent comparison of EO reps, thus helping to ensure that aggregated data are correctly analyzed and interpreted.

Very high (>95%)
High (>80%, <= 95%)
Medium (>20%, <= 80%)
Low (>0%, <= 20%)
Unknown
(null) - Not assessed

Precision

A single-letter code for the precision used to map the Element Occurrence (EO) on a U.S. Geological Survey (USGS) 7.5' (or 15') topographic quadrangle map, based on the previous Heritage methodology in which EOs were located on paper maps using dots.

S - Seconds: accuracy of locality mappable within a three-second radius; 100 meters from the centerpoint
M - Minute: accuracy of locality mappable within a one-minute radius; 2 km from the centerpoint
G - General: accuracy of locality mappalbe to map or place name precision only; 8 km from centerpoint
U - Unmappable

Brooks, Shaun

From: Wells, Kimberly <Kimberly.Wells@nexteraenergy.com>
Sent: Monday, August 29, 2016 2:52 PM
To: Martell, Mark
Cc: Low, Tara; Brooks, Shaun
Subject: FW: meeting with NextEra week of 12/14?

From: Wells, Kimberly
Sent: Monday, November 30, 2015 11:26 AM
To: Kevin Shelley
Cc: Farmer, Chris; Nagy, Laura
Subject: RE: meeting with NextEra week of 12/14?

Hi Kevin,

I hope you had a nice holiday break. I'm checking in to see if you had time to review and consider our proposed meeting time below. Our team will be in town for an event on Tuesday evening (12/15), so we would love to make this work if you and your team are available.

I will call you to follow up if we haven't connected by Wednesday morning.

Kim

Kimberly Wells, Ph.D.
Environmental Services Project Manager
NEXTera Energy Resources, LLC
601 Travis Street, Suite 1900
Houston, TX 77002
713.951.5372 (office)
832.538.7935 (mobile)
Kimberly.Wells@NEE.com

From: Wells, Kimberly
Sent: Monday, November 23, 2015 11:53 AM
To: 'Kevin Shelley'
Cc: Farmer, Chris; Nagy, Laura
Subject: meeting with NextEra week of 12/14?

Hi Kevin,

Our Development Team is preparing to submit three different wind farms for PSC permitting over the next couple of months for 2016 CODs and was wondering if you or your staff would be available to meet with us the week of 12/14 in your office. Two of the wind farms are closest to Dickinson with Brady I in Stark County and Brady II immediately south of Brady I in Hettinger County and the third will be another addition to our existing two operating phases to create an Oliver III in Oliver and Morton Counties.

Wednesday of that week (12/16) would be ideal for our staff traveling back and forth between Dickinson and Bismarck if that worked for you, but Tuesday and Thursday are options as well around travel days.

We would also like to invite NDGFD if your office would be able to host us in the conference room we have used for Wilton meetings or another suitable room.

We are happy to provide additional materials including maps and summaries of our completed due diligence prior to the meeting.

Let me know if this would work or if we need to explore other options.

Thanks!

Kim

Kimberly Wells, Ph.D.
Environmental Services Project Manager
NEXTera Energy Resources, LLC
601 Travis Street, Suite 1900
Houston, TX 77002
713.951.5372 (office)
832.538.7935 (mobile)
Kimberly.Wells@NEE.com

Brooks, Shaun

From: Wells, Kimberly <Kimberly.Wells@nexteraenergy.com>
Sent: Monday, December 14, 2015 10:08 AM
To: Kevin Shelley; Schumacher, John D.
Cc: Hochmuth, Melissa; Laura Nagy (laura.nagy@iberdrolaren.com); Farmer, Chris; Trumbauer, Mark; Wells, Kimberly
Subject: NEER ND Wind meeting materials
Attachments: NEER ND Wind Wildlife summary diligence 12112015.docx; NEER Brady II map 12112015.pdf; NEER Brady I map 12112015.pdf; NEER Oliver III map 12112015.pdf

Kevin and John,

I have attached some materials to facilitate our meeting with you on Wednesday at Kevin's office regarding the three wind projects in ND that we are proposing to build in 2016 (Brady I, Brady II, and Oliver III). They include:

- Summary of the three projects and all completed, in progress, or planned wildlife due diligence following the USFWS Wind Energy Guidelines (WEGs) (one page Word doc)
- Map showing natural resource issues and constraints for each projects including all known eagle nests within 10 miles (one PDF map per project)

We will also be bringing printed copies for you both and a couple of larger maps for our discussion.

See you Wednesday morning!

Kim

Kimberly Wells, Ph.D.
Environmental Services Project Manager
NEXTera Energy Resources, LLC
601 Travis Street, Suite 1900
Houston, TX 77002
713.951.5372 (office)
832.538.7935 (mobile)
Kimberly.Wells@NEE.com

NextEra North Dakota Projects – Brady I, Brady II, Oliver III
Meeting Summary
16 December, 2015

In attendance:

- Kevin Shelley, US Fish and Wildlife Service (USFWS)
- John Schumacher, ND Game and Fish (NDGF)
- Kim Wells, NextEra
- Melissa Hochmuth, NextEra
- Chris Farmer, Tetra Tech
- Laura Nagy, DNV GL

Handouts provided during meeting and via email:

- NEER ND Wind wildlife summary diligence 12112015.docx
- NEER Brady I map 12112015.pdf
- NEER Brady II map 12112015.pdf
- NEER Oliver III map 12112015.pdf

Attachments to the meeting summary:

- NEER Brady Wind I and II native prairie map
- NEER Oliver III native prairie map

Introductions:

The group gave introductions and then Kim and Melissa provided an overview of the Projects by walking through the NEER ND Wind Wildlife summary diligence document, which summarizes the due diligence completed, planned, and in progress for the Brady I, Brady II, and Oliver III Projects.

Brady I and II:

- Melissa provided a description of Brady and Brady II. These projects are adjacent (Brady I in Stark County and Brady II primarily in Hettinger County) approximately 15 miles south of the city of Dickinson.
- Each project is 150 MW.
    - Brady I ~ 87 turbines.
    - Brady II ~ 72 turbines.
    - Projects will share a 19 mile, above-ground transmission (gen-tie) line.
    - Brady I
        - PPA with Basin Electric
        - Stark County Conditional Use Permit received on December 22, 2015
        - Submitted the PUC application for the wind farm and transmission line in December 2015.

- Brady II also has a PPA with Basin electric.
- Both Brady I and Brady II are expected to be operational by the end of 2016.

Oliver III:

- The existing Oliver complex has two operating sites, Oliver I and Oliver II.
- Oliver III is the third phase of this project, proposed to construct an additional 100 MW approximately 10 miles southeast of the existing complex.
- Oliver III is currently negotiating a PPA and was previously permitted through the Public Service Commission in 2011, so there is a larger amount of due diligence for this site.

Brady I and II Discussion

Eagles:

- The group reviewed the location of the eagle nests within 10 miles of the project boundaries. Kevin identified that this is an area with wintering golden eagles.
- Kevin asked John if the state collects wintering eagle data. John responded that they do not.
- Chris identified that winter eagle data collection is ongoing.

Dakota Skipper:

- Kevin identified that the presence/absence county-level information in the listing decision may not capture the current understanding of skipper presence.
- Kevin said that USFWS has assembled a skipper database that contains data through 2013. This database is not currently publically available, but Kevin offered to assess the nearest skipper locations if NextEra would provide him with shapefile of the project.
- Kim agreed to provide these files and asked if he was aware of any skippers within the project counties. He said he did not believe they had skippers documented in these counties.
- Kevin suggested that NextEra take a landscape look at potential skipper habitat, including potential connectivity. He recommended that the analysis use a minimum patch size of ¼ acres, which is equivalent to 1/10 hectare. He suggested evaluation of potential skipper habitat as starting with a desktop analysis, then evaluate the vegetation present in the potential locations followed by skipper surveys, as appropriate.

PLOTS (Private Lands Open to Sportsmen):

- John explained that PLOTS is an access easement and that if a landowner enters into an agreement he or she needs to contact the department and identify the acreages being removed from the agreement. He said that most PLOTS were usually in place for one year; however, if they were paid access, there would be a pro-rated amount that would need to be paid back. The state keeps an accurate list of PLOTS areas on their website.

Site Visit

- Kim offered that NextEra would be happy to provide a tour of their existing facilities located ~20-25 min north of Bismarck.

Prairie Dogs and Black-footed Ferrets:

- Kevin asked if prairie dog towns were mapped and Kim responded that there haven't been systematic surveys to date.
- John said that the state maintains a GIS layer of prairie dog towns and that Sandra would be the point-of-contact for those data. The state historically kept an atlas of prairie dog towns, but this has not been as well maintained in the last 10 years.
- Kevin said that he was aware of some significant prairie-dog towns in the New England area, up to several thousand acres, that might come into play for foraging golden eagles. At one point, this area was considered for black-footed ferret reintroduction, but there were not enough land owners to get the acreage.
- Kevin said that there was an unconfirmed report of black-footed ferrets in 2012 close to Dickinson; however, they were not confirmed during follow up surveys by the USFWS.
- NDGF provided shapefiles of documented prairie dog colonies and burrowing owls in and near the projects. There is a 43-acre prairie dog colony in the northeast portion of the Brady project area that was observed as unoccupied in 2011 and an 18-ac colony north of the Brady project area that was also observed as unoccupied in 2011. All documented occupied prairie dog colonies and burrowing owls were located over 5 miles to the west of both Brady and Brady II (none were located in the vicinity of Oliver III).

Easements:

- Kevin asked if the maps addressed all of the existing easements held by the USFWS for grassland easements, particularly in the vicinity of Hettinger County Waterfowl Production Area (WPA).
- NextEra and Tetra Tech received confirmation from Sue Kvas at USFWS that there are no USFWS interests (easements or WPA) within the boundary of the three projects or within 10 miles, with the exception of the Hettinger County WPA within 10 miles of Brady II.

Sage grouse:

- Kevin identified that the projects are on the edge of the sage grouse range and would most likely be an issue for Brady I. He believed that the 10-mile buffer was likely within the historic, but not the current range.
- Kevin suggested that NextEra query Aaron Robinson of NDGF regarding current sage grouse locations.

Northern long-eared bats:

- Kevin asked if the group had Dr. Erin Gillam's report on northern long-eared bats because her studies confirmed northern long-eared bats in western North Dakota. Kim asked if Kevin could share her report. Kevin emailed the report to the group during the meeting.

Brady I and II as separate projects vs. a singular project:

- Kevin said that he didn't see differences in environmental issues between the two Brady projects and that he would find the review easier if it was all done as part of one analysis.

- Kim explained that the projects were separated because of the separate permitting and financing processes but that she would discuss the idea with her legal team to evaluate that option.

Oliver III Discussion:

Whooping crane:

- The group discussed that this project is closer to the center of the whooping crane corridor than the Brady projects.
- Kevin offered to review the project with respect to the whooping crane locations once he has the project shapefiles.

Northern long-eared bat:

- Kevin mentioned that because of the Mississippi River, the Oliver III project may have a higher probability of having northern long-eared bats than the other projects.

Sprague's pipet:

- Kevin said that USFWS has the listing decision for the Sprague's pipet and anticipates publishing a batch finding in the 1st quarter on 2016. He stated that USFWS will emphasize pre-listing considerations to avoid lethal or demographic consequences to unlisted species to avoid the need for additional listings.

BBCS Considerations

Items identified by Kevin as those that should be considered in the BBCS are as follows:

- Prairie obligate species
- Birds of conservation concern
- Northern long-eared bats
- Species found in post-construction mortality monitoring surveys
- Voluntary mitigation

Voluntary Considerations

- Kevin mentioned that if there appear to be potential impacts to species like prairie obligates; NextEra could consider a voluntary donation as compensatory mitigation.
- Options include USFWS conservation easements or potentially conservation banks, although these are in the early development. Kevin offered to put NextEra in touch with the person in charge of the easement program.
- Kim stated that she would be interested in talking with her to understand the cost and process so that NextEra could consider this for these or future projects.

Action Items (Current Status)

NextEra:

- Provide shapefiles of each project boundary and 10-mile buffer to USFWS and NDGFD (complete; sent on 01/11/16).
- Contact Sandra to get the prairie dog database and then evaluate prairie dog use in the vicinity of the project (complete; contacted on 01/11/16 and shapefiles received 01/20/16).
- Check to see if there are other easements near Hettinger WPA through NextEra's easement point person (complete; there are none, according to Sue Kvas at USFWS)
- Query Aaron Robinson regarding sage grouse locations (query sent on 01/11/16)
- Generate and share depiction of the grassland maps and forested areas for each project for landscape evaluation (transmitted with meeting summary)
- Have an internal discussion about the potential of separate or tiered BBCSs (discussions in progress as of 01/11/16)

USFWS:

- Share Erin Gillam's report on northern long-eared bats – (completed)
- Review the project shape files for locations of whooping cranes and Sprague's pipits (pending)
- Provide contact for USFWS' easement program manager to NextEra (pending)

From: Griger, Anne Marie
To: Wells, Kimberly (Kimberly.Wells@nexteraenergy.com)
Cc: McCall, Sarah; Farmer, Chris
Subject: FW: Project shapefiles for Brady, Brady II, and Oliver III
Date: Wednesday, January 20, 2016 7:12:24 AM

Kim, see below. This is confirmation from USFWS that there are no easements or USFWS-owned lands in or adjacent to the Brady, Brady II, or Oliver III project areas. This was an action item from your December meeting with USFWS.

From: Sue Kvas [mailto:sue_kvas@fws.gov]
Sent: Wednesday, January 20, 2016 8:10 AM
To: Griger, Anne Marie <Anne-Marie.Griger@tetratech.com>
Subject: RE: Project shapefiles for Brady, Brady II, and Oliver III

Hey Anne-Marie,

I reviewed your project area and there are no USFWS interests in the areas you provided.

Thanks,

Sue

Susan Kvas
Supervisory Fish and Wildlife Biologist
US Fish & Wildlife Service
Habitat and Population Evaluation Team – HAPET
3425 Miriam Ave.
Bismarck, ND 58503
Office : 701-355-8541

From: Griger, Anne Marie [mailto:Anne-Marie.Griger@tetratech.com]
Sent: Tuesday, January 19, 2016 11:14 AM
To: sue_kvas@fws.gov
Subject: RE: Project shapefiles for Brady, Brady II, and Oliver III

Hello Sue,

Can you please let me know if you received this email from last week, or if you need me to re-send? I sent unzipped shapefiles.

Thank you,

Anne-Marie

From: Griger, Anne Marie
Sent: Monday, January 11, 2016 4:43 PM
To: 'sue_kvas@fws.gov' <sue_kvas@fws.gov>
Cc: Farmer, Chris <Chris.Farmer@tetratech.com>; Wells, Kimberly (Kimberly.Wells@nexteraenergy.com) <Kimberly.Wells@nexteraenergy.com>; 'laura.nagy@dnvgl.com' <laura.nagy@dnvgl.com>; McCall, Sarah <Sarah.McCall@tetratech.com>
Subject: Project shapefiles for Brady, Brady II, and Oliver III

Hello Sue,

Can you please confirm there are no easements or fee-title lands within or near the Brady, Brady II, and Oliver III project areas? Shapefiles of each are attached. I believe that there are no easements west of the Missouri River in North Dakota, but wanted to confirm.

Thank you,

Anne-Marie

Anne-Marie Griger, AICP | **Senior Environmental Planner**
Direct: 512. 213.8501
anne-marie.griger@tetratech.com

Tetra Tech, Inc.
8911 N. Capital of Texas Hwy, Bldg 2 Suite # 2310
Austin, TX 78759

Griger, Anne Marie

From: Johnson, Sandra K. <sajohnson@nd.gov>
Sent: Wednesday, January 20, 2016 9:06 AM
To: Griger, Anne Marie
Subject: RE: Prairie dog database
Attachments: burrowing_owl.shx; burrowing_owl.dbf; burrowing_owl.prj; burrowing_owl.sbn; burrowing_owl.sbx; burrowing_owl.shp; prairie_dog.shx; prairie_dog.dbf; prairie_dog.prj; prairie_dog.sbn; prairie_dog.sbx; prairie_dog.shp

Hi Anne-Marie,
Attached is the data. Let me know if you have any questions.
Sandy

From: Griger, Anne Marie [mailto:Anne-Marie.Griger@tetratech.com]
Sent: Tuesday, January 19, 2016 3:02 PM
To: Johnson, Sandra K. <sajohnson@nd.gov>
Subject: RE: Prairie dog database

Hello Sandy,

Please see the attached signed agreement. Thank you!

From: Johnson, Sandra K. [mailto:sajohnson@nd.gov]
Sent: Wednesday, January 13, 2016 3:03 PM
To: Griger, Anne Marie <Anne-Marie.Griger@tetratech.com>
Subject: RE: Prairie dog database

Anne-Marie,
Attached is a data sharing agreement for the prairie dog and burrowing owl data. There are no known locations within the Oliver III buffer. Please note that we have revised the agreement to include a 4th condition. Your organization has been courteous and provided eagle data in return to us in the past. However, others have not and therefore we added it to the agreement.
Thanks,
Sandy

Sandy Johnson
Conservation Biologist
North Dakota Game and Fish Department
100 N. Bismarck Expwy.
Bismarck, ND 58501-5095
Phone: 701-328-6382
sajohnson@nd.gov
http://gf.nd.gov/

From: Griger, Anne Marie [mailto:Anne-Marie.Griger@tetratech.com]
Sent: Monday, January 11, 2016 10:05 AM
To: Johnson, Sandra K. <sajohnson@nd.gov>
Cc: Wells, Kimberly (Kimberly.Wells@nexteraenergy.com) <Kimberly.Wells@nexteraenergy.com>; Farmer, Chris <Chris.Farmer@tetratech.com>; 'laura.nagy@dnvgl.com' <laura.nagy@dnvgl.com>; McCall, Sarah

<Sarah.McCall@tetratech.com>
Subject: Prairie dog database

Hello Sandy,

As follow up from a meeting that John Schumacher attended with our client NextEra, I wanted to get further information regarding prairie dog colonies and grouse in Hettinger and Stark counties. Can you please provide the prairie dog database? I have attached shapefiles that show three project boundaries (Brady, Brady II, and Oliver III), plus a 10-mile buffer around each.

We have already signed a confidentiality agreement with you for eagle nests for all three projects, so let me know if we need to sign another. Also, I left you a voicemail last week, so please give me a call when you have a chance.

Thank you,

Anne-Marie
Anne-Marie Griger, AICP | **Senior Environmental Planner**
Direct: 512. 213.8501
anne-marie.griger@tetratech.com

Tetra Tech, Inc.
8911 N. Capital of Texas Hwy, Bldg 2 Suite # 2310
Austin, TX 78759

Griger, Anne Marie

From: Robinson, Aaron C. <acrobinson@nd.gov>
Sent: Wednesday, March 09, 2016 2:53 PM
To: Griger, Anne Marie
Cc: Wells, Kimberly (Kimberly.Wells@nexteraenergy.com)
Subject: RE: Grouse info for Brady, Brady II and Oliver III projects
Attachments: Brady Grouse Lek Survey Protocol to NDGF.docx

See attached, let me know if you have any questions.

Aaron

****

Aaron Robinson
Upland Game Management Supervisor
North Dakota Game and Fish
225 30th Ave. SW
Dickinson, ND 58601
Cell: 701-290-1370
acrobinson@nd.gov
www.gf.nd.gov

From: Griger, Anne Marie [mailto:Anne-Marie.Griger@tetratech.com]
Sent: Wednesday, March 9, 2016 1:19 PM
To: Robinson, Aaron C. <acrobinson@nd.gov>
Cc: Wells, Kimberly (Kimberly.Wells@nexteraenergy.com) <Kimberly.Wells@nexteraenergy.com>
Subject: RE: Grouse info for Brady, Brady II and Oliver III projects

Hello Aaron,

Can you please let me know when you anticipate having comments on our proposed lek survey protocol that I provided to you on February 8? We are planning to use the same protocol for Brady, Brady II, and Oliver III.

Thank you,

Anne-Marie

From: Griger, Anne Marie
Sent: Wednesday, March 02, 2016 12:54 PM
To: 'Robinson, Aaron C.' <acrobinson@nd.gov>
Subject: RE: Grouse info for Brady, Brady II and Oliver III projects

Hi Aaron,

I just wanted to check in again regarding any feedback on our protocol for lek surveys. We are planning to start our lek surveys at Brady and Brady II on March 25.

Thank you,

Anne-Marie

From: Robinson, Aaron C. [mailto:acrobinson@nd.gov]
Sent: Wednesday, February 03, 2016 10:14 PM
To: Griger, Anne Marie <Anne-Marie.Griger@tetratech.com>
Subject: RE: Grouse info for Brady, Brady II and Oliver III projects

Anne – I looked through our database and the areas where you have the wind farms proposed do not overlap with our grouse census blocks. That does not mean that there are no grouse leks in the area, we just don't have the man power to survey the entire state. My recommendation would be to allow me to help design a survey protocol for both these areas. The oliver block it in prime grouse habitat and the Brady block is also in good sharp-tail habitat. Please give me a call so we can discuss this further.

Regards,
Aaron

****

Aaron Robinson
Upland Game Management Supervisor
North Dakota Game and Fish
225 30th Ave. SW
Dickinson, ND 58601
Cell: 701-290-1370
acrobinson@nd.gov
www.gf.nd.gov

From: Griger, Anne Marie [mailto:Anne-Marie.Griger@tetratech.com]
Sent: Monday, January 11, 2016 3:37 PM
To: Robinson, Aaron C. <acrobinson@nd.gov>
Cc: Farmer, Chris <Chris.Farmer@tetratech.com>; 'laura.nagy@dnvgl.com' <laura.nagy@dnvgl.com>; Wells, Kimberly (Kimberly.Wells@nexteraenergy.com) <Kimberly.Wells@nexteraenergy.com>; McCall, Sarah <Sarah.McCall@tetratech.com>
Subject: Grouse info for Brady, Brady II and Oliver III projects

Hello Aaron,

As follow up from a meeting that John Schumacher attended with our client NextEra, I would like to request information you have regarding sage grouse locations in Hettinger and Stark counties. I have attached shapefiles that show two project boundaries (Brady and Brady II), plus a 10-mile buffer around each. If you also have locations of other known grouse or grouse leks in the vicinity of these areas or near the Oliver III project in Morton and Oliver counties (shapefiles also attached), we would appreciate that information as well.

Thank you,

Anne-Marie
Anne-Marie Griger, AICP | **Senior Environmental Planner**
Direct: 512. 213.8501
anne-marie.griger@tetratech.com

Tetra Tech, Inc.
8911 N. Capital of Texas Hwy, Bldg 2 Suite # 2310
Austin, TX 78759

Brooks, Shaun

From: Wells, Kimberly <Kimberly.Wells@nexteraenergy.com>
Sent: Monday, August 29, 2016 2:44 PM
To: Martell, Mark
Cc: Low, Tara; Brooks, Shaun
Subject: FW: NextEra ND Wind Projects Meeting: Summary and Status Update

---

From: Kevin Shelley [mailto:kevin_shelley@fws.gov]
Sent: Tuesday, January 26, 2016 9:13 AM
To: Wells, Kimberly
Cc: Schumacher, John D.; Farmer, Chris; Griger, Anne-Marie (Anne-Marie.Griger@tetratech.com); McCall, Sarah; Nagy, Laura; Hochmuth, Melissa; Trumbauer, Mark
Subject: Re: NextEra ND Wind Projects Meeting: Summary and Status Update

---

Kimberly: msg. rec'd along with 7 attachments. KS

Sent from my iPhone

Kevin Shelley
ND State Supervisor
Ecological Services

On Jan 26, 2016, at 9:03 AM, Wells, Kimberly <Kimberly.Wells@nexteraenergy.com> wrote:

> Kevin and John,
>
> Happy New Year! Hope you both had a nice holiday break.
>
> As a follow up to our meeting in December in Kevin's office, I am providing the following attachments per your suggestion:
>
> - Draft meeting minutes for your review (Word document)
> - Updated habitat maps for each of the three projects (Brady I/II combined and Oliver III) showing native prairie and forest cover (PDF files)
> - Brief summary of methodology used for the desktop native prairie assessment followed by a field verification to support what is shown in maps (Word document)
> - Updated shape files sets for each project for cross checking against your internal databases for skippers, whooping cranes, and Sprague's pipit occurrences (zipped shape files)
>
> Note our minutes summarize the status of your suggestions including inquiries with your respective offices that have been completed or in progress. Our hearing with the PSC for Brady I has been scheduled for 3/2, so we would greatly appreciate receiving the results of your internal data base queries using these shape files as soon as possible. Chris Farmer with Tetra Tech will follow up with

within the week to check in on that and discuss some of our questions regarding BBCS format and organization to address your suggestions.

Could you please confirm receipt of this email?

Thanks!

Kim

Kimberly Wells, Ph.D.
Environmental Services Project Manager
NEXTera Energy Resources, LLC
601 Travis Street, Suite 1900
Houston, TX 77002
713.951.5372 (office)
832.538.7935 (mobile)
Kimberly.Wells@NEE.com

<image001.jpg>

<BradyII_Prairie_NLCD.zip>

<Oliver III_habitats.pdf>

<OliverIII_Prairie_NLCD.zip>

<Brady and Brady II_habitats.pdf>

<Brady_Prairie_NLCD_prairie dogs_burrowing owls.zip>

<NEER ND projects USFWS agency meeting minutes 012616.docx>

<NEER ND Native Prairie and Forest Cover Methods 01262016.docx>

Brooks, Shaun

From: Wells, Kimberly <Kimberly.Wells@nexteraenergy.com>
Sent: Monday, August 29, 2016 2:44 PM
To: Martell, Mark
Cc: Low, Tara; Brooks, Shaun
Subject: FW: Brady Wind Project

From: Wells, Kimberly
Sent: Thursday, February 04, 2016 6:09 AM
To: Kevin Shelley; Farmer, Chris
Cc: Griger, Anne Marie; Wells, Kimberly
Subject: RE: Brady Wind Project

Hi Kevin,

Thanks for your comments. Did you also have a chance to cross check the shape files data sets we sent for our three ND wind projects against your internal data bases for skippers and whooping cranes? Our Brady I hearing with the PSC is coming up on 3/2, so if your data shows something other than what we already have and shared, it would be ideal to know about that prior to the hearing to avoid any potential surprises.

Kim

Kimberly Wells, Ph.D.
Environmental Services Project Manager
NEXTera Energy Resources, LLC
601 Travis Street, Suite 1900
Houston, TX 77002
713.951.5372 (office)
832.538.7935 (mobile)
Kimberly.Wells@NEE.com

From: Kevin Shelley [mailto:kevin_shelley@fws.gov]
Sent: Wednesday, February 03, 2016 3:50 PM
To: Farmer, Chris
Cc: Wells, Kimberly; Griger, Anne Marie
Subject: RE: Brady Wind Project

Chris;?? I performed a cursory review and have a few comments for you and the other to contemplate ??in reply to your vmessage earlier today.?? I???ll be in the Office both Th and Fr this week if you would like to discuss.?? More ideas may come to mind as I get more time to think critically, but a few ideas came to mind from my insights from other similar efforts.??
??
Thank you for the opportunity.?? K
??
Kevin Shelley, ND State Supervisor
U.S. Fish and Wildlife Service??
Ecological Services
3425 Miriam Ave.??
Bismarck, ND 58501
Office: 701.250.4402????*Mobile*: 701.989.4233
??

From: Farmer, Chris [mailto:Chris.Farmer@tetratech.com]
Sent: Friday, January 29, 2016 4:21 PM
To: Kevin Shelley
Cc: Kim Wells; Griger, Anne Marie
Subject: Brady Wind Project
??
Hi Kevin,
???????????????????????????? We have developed the attached outline of the Wildlife Conservation Strategy for the Brady Wind Energy Project based on the Region 6 outline and our meeting with you in December.?? I am hoping you can find some time to review it over the next few days, then I would like to call you near the middle of next week to gather feedback before working it into our WCS effort.?? Please let me know when might be a good time to follow-up with you.
??
-Chris
??
Chris Farmer, Ph.D. | **National Discipline Lead - Biology**
??
Associate Editor, Journal of Raptor Research
Direct: 215.702.4121 | Main: 215.702.4000 |Cell: 617.834.8761
Chris.Farmer@tetratech.com
??
Tetra Tech | **Sciences**
One Oxford Valley, Suite 200 | Langhorne, PA 19047 | www.tetratech.com
??

??

RECORD OF CONVERSATION

TO: Aaron Robinson, Upland Game Management Supervisor, North Dakota Game and Fish

PHONE #: 701-290-1370

FROM: Chris Farmer

DATE: 02/04/2016 TIME: 2:30 PM

SUBJECT: Grouse Info for Brady, Brady II, and Oliver III Projects

CONVERSATION: – I called Mr. Robinson to get his feedback on Tetra Tech's planned lek survey protocol for surveys starting in March 2016 for the Brady, Brady II, and Oliver III projects. Mr. Robinson agreed that he would provide feedback after I send him our planned protocol and survey route map.

RECORD OF CONVERSATION

TO: Kevin Shelley, USFWS

PHONE #: 701-355-8512

FROM: Chris Farmer

DATE: 02/08/2016 TIME: 1302

SUBJECT: Brady Wind Energy Project

CONVERSATION: – I called Mr. Shelley to discuss his comments on the Brady Wildlife Conservation Strategy Outline and to check on the status of USFWS action items from the meeting of December 16, 2015.

Mr. Shelley acknowledged that he has received Brady Project shapefiles from Anne-Marie Griger and intends to compare them to the USFWS databases of locations for whooping cranes and Dakota skipper. He has not yet made those comparisons, however, he will do so as soon as possible for the whooping crane. Regarding the Dakota skipper, he informed me that he had requested the most recent location database from the USFWS Region 3 office, but that it was not yet available to him. Update reports from ESA Section 10 permittees were due to Region 3 on January 31, 2016, and they were still updating the database. Mr. Shelley was doubtful that any update would be received prior to the Brady Project PSC meeting on March 2, 2016.

The discussion then turned to his input regarding the Wildlife Conservation Strategy outline Brady Wind shared with him on January 29, 2016. With respect to area-sensitive species, he told me that the North Dakota Field Office used to have a list of species it considered area sensitive on its website, but he was not sure whether it was still there since the website was migrated to a new host a few months ago. He suggested that we check for the list on the website, and if we cannot find it, contact him to request the list, which he feels should form the starting point for consideration of area sensitive species. He suggested that NDGF may also have some area-sensitive species information available in the recent update of its Wildlife Action Plan.

Regarding his comments on the definition of impact, he requested that we arrange a meeting or conference call involving USFWS and NDGF to discuss how this could be defined for the Project. His focus is on identifying and avoiding/minimizing impacts that have demographic consequences for species sensitive to anthropogenic influences. We discussed the difficulty of monitoring for demographic impacts within the scope of wind farm monitoring, and he suggested that engaging in a larger conversation would be the most productive path going forward. Mr. Shelley suggested that he would like additional future conversation involving Brady and the agencies as the Project Wildlife Conservation Strategy is developed.

I thanked Mr. Shelley for engaging with Brady Wind on this Project and told him that I would discuss next steps with Brady Wind. The call ended at 13:31 Eastern time.

CJF

Griger, Anne Marie

From: Griger, Anne Marie
Sent: Monday, March 28, 2016 3:11 PM
To: Griger, Anne Marie
Subject: FW: Checking in

From: Wells, Kimberly [mailto:Kimberly.Wells@nexteraenergy.com]
Sent: Monday, March 28, 2016 1:13 PM
To: Jamieson, Amie <Amie.Jamieson@nee.com>
Cc: Griger, Anne Marie <Anne-Marie.Griger@tetratech.com>; Martell, Mark <Mark.Martell@tetratech.com>; Christopher.Farmer@dnvgl.com; Hochmuth, Melissa <Melissa.Hochmuth@nexteraenergy.com>; Brian Bjella <bbjella@crowleyfleck.com>; Stephanie Dassinger <sdassinger@crowleyfleck.com>
Subject: Fwd: Checking in

Kim Wells
Environmental Services Project Manager
NextEra Energy Resources
832.538.7935 (cell)

Begin forwarded message:

> **From:** Kevin Shelley <kevin_shelley@fws.gov>
> **Date:** March 28, 2016 at 1:00:42 PM CDT
> **To:** "Wells, Kimberly" <Kimberly.Wells@nexteraenergy.com>
> **Subject: Re: Checking in**
>
> Kimberly: I am in Albuquerque this week, so my prospects as a witness are nil. I have had numerous conversations with local producers and landowners and have heard their concerns -
>
> Given the many demands I currently face and the short time I've had to review the Brady docs (rec'd 2/22), I have not yet completed my review nor come to any preliminary insights...but I did bring the docs with me so I expect later this week I will be in a better position for commenting.
>
> Given the local interest I believe this hearing is one I should have testified. K
>
> Sent from my iPhone
>
> Kevin Shelley
> ND State Supervisor
> Ecological Services
>
> > On Mar 28, 2016, at 11:37 AM, Wells, Kimberly <Kimberly.Wells@nexteraenergy.com> wrote:

Hi Kevin,

I just called your office today to check in and understand you are out all week in meetings. I tried your cell as well, but wasn't able to leave a message.

Our Brady I PSC hearing is this Wednesday, so I thought I would check in to see if you had any new data or follow up on the items we previously discussed to avoid any surprises. I believe you were waiting for feedback on any skipper occurrences, in addition to any pertinent data on whooping crane detections.

We will have a draft BBCS for your review and input shortly, so if any new data we could incorporate.

I also see one of the parties (Concerned Citizens of Stark County) in our PSC case has listed you as a potential witness at the Brady hearing this week about eagles and was wondering if you were aware of that.

I'm flying up to Bismarck today, so cell phone is best if you have time to return a call or email this week.

Kim Wells

Environmental Services Project Manager

NextEra Energy Resources

832.538.7935 (cell)

Brooks, Shaun

From: Wells, Kimberly <Kimberly.Wells@nexteraenergy.com>
Sent: Monday, August 29, 2016 2:50 PM
To: Martell, Mark
Cc: Low, Tara; Brooks, Shaun
Subject: FW: NextEra: Brady I/II updated raptor nest survey results

---

From: Wells, Kimberly
Sent: Wednesday, April 06, 2016 3:16 PM
To: Kevin Shelley
Cc: christopher.farmer@dnvgl.com; Martell, Mark; Hochmuth, Melissa
Subject: RE: NextEra: Brady I/II updated raptor nest survey results

Hi Kevin,

How about next Tuesday (4/12) at 3 Central? If that works, I'll send an invite with conference info.

Kim

From: Kevin Shelley [mailto:kevin_shelley@fws.gov]
Sent: Tuesday, April 05, 2016 7:57 PM
To: Wells, Kimberly
Cc: christopher.farmer@dnvgl.com; Martell, Mark; Hochmuth, Melissa
Subject: Re: NextEra: Brady I/II updated raptor nest survey results

Kim: I have a change in plans now and will no longer be available on Friday. Im looking into next week now. The 12th is open in the afternoon

Sent from my iPhone

Kevin Shelley
ND State Supervisor
Ecological Services

On Apr 5, 2016, at 1:15 PM, Wells, Kimberly <Kimberly.Wells@nexteraenergy.com> wrote:

> Hi Kevin,
>
> Would any time Friday afternoon between 1 and 4 Central your time work for a short call? If morning is better, I can step out of Brady II Hettinger II County hearing to call you. We will provide a bulleted summary of eagle studies and preliminary findings before then as well to support our discussion.
>
> Kim
>
> Kimberly Wells, Ph.D.

Brooks, Shaun

From: Wells, Kimberly <Kimberly.Wells@nexteraenergy.com>
Sent: Monday, August 29, 2016 2:50 PM
To: Martell, Mark
Cc: Low, Tara; Brooks, Shaun
Subject: FW: NextEra: Brady I/II updated raptor nest survey results

---

From: Wells, Kimberly
Sent: Monday, April 11, 2016 10:54 AM
To: Kevin Shelley
Cc: christopher.farmer@dnvgl.com; Martell, Mark; Hochmuth, Melissa; Wells, Kimberly (Kimberly.Wells@nexteraenergy.com)
Subject: RE: NextEra: Brady I/II updated raptor nest survey results

Hi Kevin,

I am following up on my email and invite from last week to see if tomorrow at 3 pm Central still works to connect via phone. I believe you confirmed receipt of our Brady I reports on 2/22 and we will be prepared to discuss the ongoing eagle studies we have been completing tomorrow if that still works. We have initiated focused nest monitoring at the golden eagle nest closest to the project since discovering it was active and occupied (previously thought to be an unoccupied small stick nest most likely for other non-eagle raptor species) on our most recent aerial surveys. As I mentioned, we are specifically interested in feedback on buffers or setbacks given the map we provided of proposed turbine locations.

If I don't hear from you by the end of today, I'll try you via phone to see if tomorrow still works.

Thanks!

Kim

From: Kevin Shelley [mailto:kevin_shelley@fws.gov]
Sent: Tuesday, April 05, 2016 7:57 PM
To: Wells, Kimberly
Cc: christopher.farmer@dnvgl.com; Martell, Mark; Hochmuth, Melissa
Subject: Re: NextEra: Brady I/II updated raptor nest survey results

Kim: I have a change in plans now and will no longer be available on Friday. Im looking into next week now. The 12th is open in the afternoon

Sent from my iPhone

Kevin Shelley
ND State Supervisor
Ecological Services

On Apr 5, 2016, at 1:15 PM, Wells, Kimberly <Kimberly.Wells@nexteraenergy.com> wrote:

Hi Kevin,

Would any time Friday afternoon between 1 and 4 Central your time work for a short call? If morning is better, I can step out of Brady II Hettinger II County hearing to call you. We will provide a bulleted summary of eagle studies and preliminary findings before then as well to support our discussion.

Kim

Kimberly Wells, Ph.D.
Environmental Services Project Manager
NEXTera Energy Resources, LLC
601 Travis Street, Suite 1900
Houston, TX 77002
713.951.5372 (office)
832.538.7935 (mobile)
Kimberly.Wells@NEE.com

<image001.jpg>

From: Kevin Shelley [mailto:kevin_shelley@fws.gov]
Sent: Tuesday, April 05, 2016 12:55 PM
To: Wells, Kimberly
Cc: christopher.farmer@dnvgl.com; Martell, Mark; Hochmuth, Melissa
Subject: Re: NextEra: Brady I/II updated raptor nest survey results

---

The earliest we can speak is Friday, April 8. My day is packed but I will try to work in a short call. I think the larger question may be for next era, and what the likelihood of take might be and how you want to proceed. In regards to the new golden eagle nest, have eagle you studies been performed yet? If not it seems reasonable that would be the focus of this season to assessThe risk for cake.

Sent from my iPhone

Kevin Shelley
ND State Supervisor
Ecological Services

On Apr 5, 2016, at 12:44 PM, Wells, Kimberly <Kimberly.Wells@nexteraenergy.com> wrote:

> Hi Kevin,

We completed our latest round of aerial raptor nest surveys at Brady I and II last week that are shown in the attached maps. One map shows the 10-mile radius and the other focuses in on the project boundaries with both showing current turbine locations. Specifically, we would like to discuss the occupied golden eagle nest found near the southeastern perimeter of Brady II and any turbine siting recommendations you may have.

When might you have some time to talk on the phone about this? Alternatively, Melissa (our developer) and I are both in town later this week and could potentially come meet you in your office on Thursday if that is an option. A conversation sooner than later in whatever venue is easiest would be our preference.

Kim

Kimberly Wells, Ph.D.
Environmental Services Project Manager
NEXTera Energy Resources, LLC
601 Travis Street, Suite 1900
Houston, TX 77002
713.951.5372 (office)
832.538.7935 (mobile)
Kimberly.Wells@NEE.com

<NEER Brady I II raptor nests 10 miles 04052016.pdf>

<NEER Brady I II raptor nests 04052016.pdf>

Griger, Anne Marie

From: Griger, Anne Marie
Sent: Wednesday, April 13, 2016 9:19 AM
To: Johnson, Sandra K.
Cc: Low, Tara; Brooks, Shaun; Wells, Kimberly (Kimberly.Wells@nexteraenergy.com); Rowe, Carly; Martell, Mark
Subject: RE: Request for updated eagle nest info for Brady, Brady II and Oliver III
Attachments: Brady_Raptor_Nests_041216.prj; Brady_Raptor_Nests_041216.sbn; Brady_Raptor_Nests_041216.sbx; Brady_Raptor_Nests_041216.shp; Brady_Raptor_Nests_041216.shp.xml; Brady_Raptor_Nests_041216.shx; Brady_Raptor_Nests_041216.cpg; Brady_Raptor_Nests_041216.dbf; Brady_II_Raptor_Nests_041216.shp.xml; Brady_II_Raptor_Nests_041216.shx; Brady_II_Raptor_Nests_041216.cpg; Brady_II_Raptor_Nests_041216.dbf; Brady_II_Raptor_Nests_041216.prj; Brady_II_Raptor_Nests_041216.sbn; Brady_II_Raptor_Nests_041216.sbx; Brady_II_Raptor_Nests_041216.shp

Hello Sandy,

Attached are the shapefiles of our spring raptor nest surveys conducted for Brady and Brady II on March 29-31, 2016. Please note that we have separate files for each project (all nests within 10 miles), but many of the nests are included in both sets. We will send you the results for Oliver III soon as well.

Please confirm receipt, and let Tara and Mark (cc'd) know if you have any questions; this Friday is my last day at Tetra Tech.

Did you get the chance to visit the nests? When do you anticipate being able to provide us the updated data?

Thank you for all your help!

Anne-Marie

From: Johnson, Sandra K. [mailto:sajohnson@nd.gov]
Sent: Wednesday, April 06, 2016 1:44 PM
To: Griger, Anne Marie <Anne-Marie.Griger@tetratech.com>
Cc: Low, Tara <tara.low@tetratech.com>; Brooks, Shaun <Shaun.Brooks@tetratech.com>; Wells, Kimberly (Kimberly.Wells@nexteraenergy.com) <Kimberly.Wells@nexteraenergy.com>
Subject: RE: Request for updated eagle nest info for Brady, Brady II and Oliver III

Hi Anne-Marie,
Yes, Dan Hoenke is a game warden in Dickinson and had visited the site last week. He believes it is a golden eagle nest. There are a couple of new bald eagle nests near the Oliver III project. If the weather improves up here on Friday (it's snowing and windy today) I plan on verifying these new bald eagle sites and hopefully make it over to the new golden eagle site as well. So, next week I can send you the updated shapefiles. Are you planning on conducting aerial surveys for raptor nests this spring?
Sandy

Sandy Johnson
Conservation Biologist
North Dakota Game and Fish Department
100 N. Bismarck Expwy.
Bismarck, ND 58501-5095
Phone: 701-328-6382
sajohnson@nd.gov
http://gf.nd.gov/

From: Griger, Anne Marie [mailto:Anne-Marie.Griger@tetratech.com]
Sent: Tuesday, April 5, 2016 4:36 PM
To: Johnson, Sandra K. <sajohnson@nd.gov>
Cc: Low, Tara <tara.low@tetratech.com>; Brooks, Shaun <Shaun.Brooks@tetratech.com>; Wells, Kimberly (Kimberly.Wells@nexteraenergy.com) <Kimberly.Wells@nexteraenergy.com>
Subject: Request for updated eagle nest info for Brady, Brady II and Oliver III

Hello Sandy,

I hope this finds you doing well. I would like to request updated eagle nest shapefiles for the Brady, Brady II, and Oliver III projects plus a 10-mile buffer for each. I have attached the latest project boundaries. I heard that Dan Hanke (not sure of spelling) from NDGF confirmed an occupied golden eagle nest location for a landowner near the Brady II project a few days ago, so we wanted to make sure we have that location.

We already have a confidentiality agreement in place for all of these projects, but please let me know if we need to sign another one.

Thank you,

Anne-Marie
Anne-Marie Griger, AICP | **Senior Environmental Planner**
Direct: 512. 213.8501
anne-marie.griger@tetratech.com

Tetra Tech, Inc.
8911 N. Capital of Texas Hwy, Bldg 2 Suite # 2310
Austin, TX 78759

Kessler, Ellen

From: Martell, Mark
Sent: Thursday, April 21, 2016 10:25 AM
To: Johnson, Sandra K.; Low, Tara
Cc: Wells, Kimberly; Young, Rich
Subject: RE: Raptor Nest in Brady Wind Project
Attachments: RTHA nest 46.6N_102.7W_TetraTech.JPG

Sandy,

Thank you for providing us with the report of a raptor nest located at: 46.626939 -102.710975.

Tetra Tech/NextEra had a biologist observe the site from a public roadway and he was able to confirm the presence of a nest at that location. The biologist was able to positively identify an incubating dark phase red-tailed hawk at the nest. He saw this bird leave the nest for a short period and return – allowing him to confirm his identification. He also observed a second red-tailed hawk flying in the vicinity of the nest.

I have attached a photo of the nest taken through a spotting scope.

Mark Martell | Senior Ecologist
Direct: 612-643-2245 | Cell: 612-961-3926
mark.martell@tetratech.com

Tetra Tech, Inc. | Sciences

350 Indiana St., Suite 500, Golden, CO 80401
and
2001 Killebrew Dr. Suite 141, Bloomington, MN 55425
www.tetratech.com

From: Johnson, Sandra K. [mailto:sajohnson@nd.gov]
Sent: Monday, April 18, 2016 4:06 PM
To: Low, Tara <tara.low@tetratech.com>; Martell, Mark <Mark.Martell@tetratech.com>
Subject: Raptor Nest in Brady Wind Project

Hi Tara and Mark,
There is another nest within the footprint of the Brady Wind project that was not included in the data Anne-Marie sent. It is located at: 46.626939 -102.710975. One of the local landowners had seen a large raptor in it last week and over the weekend another landowner believes he saw a golden eagle in it. Do you still have surveyors in the area that could confirm the status of this nest?
Thanks,
Sandy

Sandy Johnson
Conservation Biologist
North Dakota Game and Fish Department

100 N. Bismarck Expwy.
Bismarck, ND 58501-5095
Phone: 701-328-6382
sajohnson@nd.gov
http://gf.nd.gov/

TETRA TECH

April 28, 2016

Kevin Shelley
North Dakota State Supervisor
U.S. Fish and Wildlife Service
Ecological Services
3425 Miriam Avenue
Bismarck, ND 58501

Dear Mr. Shelley:

As you know, Brady Wind, LLC (Brady Wind), a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC (NEER), is proposing to construct the Brady Wind Energy Center (Project) in Stark County, North Dakota. The North Dakota Public Service Commission (PSC) is reviewing Brady Wind's Application for a Certificate of Site Compatibility to construct the Project, and has requested interim information about biological resource studies currently being conducted in the Project Study Area. The enclosed memoranda have been provided to the PSC, including:

- **Raptor Nest Survey Report** – describing results of raptor nest studies conducted for the Project through March 2016.
- **Grouse Lek Survey Report** – describing results of sharp-tailed grouse lek surveys conducted for the Project through early April 2016.
- **Spring Avian Report** – describing studies conducted through March 2016 in the Project Study Area, and also describing results of studies conducted in 2015 at the proposed Dickinson Wind Energy Project (which was cancelled and not constructed), which is located approximately 8 miles north of the proposed Project.

Per our continuing conversations about the Project, these and other biological resource studies are not yet complete. NEER would like to provide you these interim reports, and will also provide final reports covering the entire survey period when they are complete.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Tara Low
Tetra Tech, Inc.
350 Indiana Street, Suite 500
Golden, Colorado 80401
Cell: 303.898.4615
tara.low@tetratech.com

TETRA TECH

April 28, 2016

Aaron Robinson
Upland Game Management Supervisor
North Dakota Game and Fish
225 30th Avenue SW
Dickinson, ND 58601

Dear Mr. Robinson:

As you know, Brady Wind, LLC (Brady Wind), a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC (NEER), is proposing to construct the Brady Wind Energy Center (Project) in Stark County, North Dakota. The North Dakota Public Service Commission (PSC) is reviewing Brady Wind's Application for a Certificate of Site Compatibility to construct the Project, and has requested interim information about biological resource studies currently being conducted in the Project Study Area. The enclosed memoranda have been provided to the PSC, including:

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Per our continuing conversations about the Project, these and other biological resource studies are not yet complete. NEER would like to provide you these interim reports, and will also provide final reports covering the entire survey period when they are complete.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Tara Low
Tetra Tech, Inc.
350 Indiana Street, Suite 500
Golden, Colorado 80401
Cell: 303.898.4615
tara.low@tetratech.com

TETRA TECH

April 28, 2016

John Schumacher
Resource Biologist
North Dakota Game and Fish
100 N. Bismarck Expressway
Bismarck, ND 58501-5095

Dear Mr. Schumacher:

As you know, Brady Wind, LLC (Brady Wind), a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC (NEER), is proposing to construct the Brady Wind Energy Center (Project) in Stark County, North Dakota. The North Dakota Public Service Commission (PSC) is reviewing Brady Wind's Application for a Certificate of Site Compatibility to construct the Project, and has requested interim information about biological resource studies currently being conducted in the Project Study Area. The enclosed memoranda have been provided to the PSC, including:

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Per our continuing conversations about the Project, these and other biological resource studies are not yet complete. NEER would like to provide you these interim reports, and will also provide final reports covering the entire survey period when they are complete.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Tara Low
Tetra Tech, Inc.
350 Indiana Street, Suite 500
Golden, Colorado 80401
Cell: 303.898.4615
tara.low@tetratech.com

Archived: Thursday, August 18, 2016 8:01:32 AM
From: Robinson, Aaron C.
Sent: Thursday, May 19, 2016 4:26:52 PM
To: Martell, Mark
Subject: RE: Sharp-tailed grouse lek buffers
Importance: Normal

Mark – I haven't forgot about you I am working with the Fish and Wildlife Service (Kevin Shelley) to determine our recommendations. I know everyone is on a time crunch and I will have something to you by early next week.

Cheers,
Aaron
****

Aaron Robinson
Upland Game Management Supervisor
North Dakota Game and Fish
225 30th Ave. SW
Dickinson, ND 58601
Cell: 701-290-1370
acrobinson@nd.gov
www.gf.nd.gov

From: Martell, Mark [mailto:Mark.Martell@tetratech.com]
Sent: Tuesday, May 3, 2016 11:18 AM
To: Robinson, Aaron C. <acrobinson@nd.gov>
Subject: Sharp-tailed grouse lek buffers

Aaron,

Sorry to bother you while you were busy earlier.

I would like to know the NDGF suggested buffers around sharp-tailed grouse leks for commercial wind developments. Both distance and timing and any other suggestions.

Thank you

Mark Martell | Senior Ecologist
Direct: 612-643-2245 | Cell: 612-961-3926
mark.martell@tetratech.com

Tetra Tech, Inc. | Sciences

350 Indiana St., Suite 500, Golden, CO 80401
and
2001 Killebrew Dr. Suite 141, Bloomington, MN 55425
www.tetratech.com

Archived: Thursday, August 18, 2016 8:02:18 AM
From: Martell, Mark
Sent: Friday, July 29, 2016 11:04:51 AM
To: Wells, Kimberly
Cc: Low, Tara; Young, Rich
Subject: North Dakota sharp-tailed grouse buffers
Importance: Normal

Kim,

I just spoke to Aaron Robinson and want to document the conversation here. He told me that NDGF is not setting out sharp-tailed grouse buffer recommendations but instead have decided that more research is needed. He informed me that he is trying to put together a group which would include Audubon, NDGF, USFWS, North Dakota State University, and yourself and that you will be having a call next week.

He also told me that he is looking for wind developers who would be interested in working with them on the project.

If I Tetra Tech can be of any help to you in this area please let me know.

Mark Martell | Senior Ecologist
Direct: 612-643-2245 | Cell: 612-961-3926
mark.martell@tetratech.com

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2001 Killebrew Dr. Suite 141, Bloomington, MN 55425
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Appendix B: Post-Construction Fatality Monitoring Protocol

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Proposed Standardized Post-construction Fatality Monitoring

The following sections describe the protocol for standardized fatality monitoring. This monitoring framework consists of standardized carcass searches conducted at a sample of the Project turbines. The number of fatalities found during searches represents a minimum number of fatalities at a project because not all fatalities that occur are found by observers. Therefore, carcass persistence trials and searcher efficiency trials will be conducted concurrently with standardized fatality monitoring to account for the bias attributable to carcass removal by scavengers and searcher efficiency. Fatality rates (e.g., birds/turbine/year and birds/operational MW/year) will then be estimated using statistical methods that adjust the number of carcasses found for detection biases. Per-turbine and per-MW estimates provide different ways of scaling fatality information to be comparable to other projects. Annual fatality rates will be calculated for all bird species combined, small (less than or equal to 10 inches) and large (greater than10 inches) birds, raptors, and sensitive species (collectively). In some cases, the sample size for a species group of interest, such as eagles or other sensitive species, may be too small to allow for the calculation of accurate fatality estimates (see Section 8.1.4). In these cases, numerical counts of total fatalities detected during standardized and operational (see Section 8.2) searches for each of these species or species groups will be substituted in place of rate estimates.

The field and analytical methods described below are consistent with post-construction fatality monitoring being conducted, or proposed, for other wind projects elsewhere in the U.S. (Johnson et al. 2003; Young et al. 2003; Jain et al. 2007; Huso 2011, Strickland et al. 2011).

Methods and timing outlined here may be modified over the course of the study as Project-specific information is gained to maximize the effectiveness and efficiency of the monitoring program (e.g., search interval, number of turbines searched, plot size).

Standardized Carcass Searches

The objective of the fatality monitoring is to identify the bird and bat species found as fatalities at the Project and to statistically estimate fatality rates. This section outlines the methods for the standardized carcass searches, which constitutes the initial step in generating the fatality estimate (i.e. finding the carcasses under the turbines). These values then will be adjusted to account for detection bias (see below). The methods for standardized carcass searches include the sampling duration and intensity, search plot size and configuration, and fatality documentation.

Sampling Duration and Intensity

Standardized post-construction fatality monitoring will consist of standardized searches of approximately 30 percent of the turbines and will be conducted for the first year of operation. To avoid bias in the fatality estimate, turbines will be selected in a stratified random manner based on habitat type and topography. To do this, habitat and topography will be determined for each turbine location and the sample turbines randomly selected from the habitat and topography categories in proportion to how often they occur in these categories. The same turbines will be

searched the entire year of the baseline monitoring period to avoid confounding effects from individual turbines.

The survey year will be divided into seasons to allow for the inclusion of season-specific searcher efficiency probabilities and carcass persistence times. Searches at each of the designated turbines will initially be conducted every 2 weeks. However, search frequency may be adjusted based on the results of seasonal carcass persistence trials in order to ensure that on average, the search interval minimizes the bias associated with carcass removal by scavengers (see below).

Seasonal sampling intervals will be as follows:

- Spring: March–1 June 15
- Summer: June 16–September 14
- Fall/Winter: September 15–December 15

Search Plot Size and Configuration

It is anticipated that the turbine pads and roads will remain clear of vegetation. The search area will consist of a square search plot centered on the turbine. The minimum distance from the turbine to the perimeter of the square will be eighty (80) percent of the turbine height. The search plot size is based on recommendations from the USFWS (2012a). Search areas will include maintained turbine pads and access roads, as well as adjacent unmaintained areas. The actual area searched will ultimately be dependent on the configuration of the maintained areas, as well as the portion of the unmaintained area that can be realistically searched as determined during the initial surveys.

Linear transects will be established within the search plots approximately 6 meters (20 feet) apart (USFWS 2012a). The searchers will walk along each transect searching both sides out to 3 meters (10 feet) for fatalities. Personnel trained and tested in proper search techniques will conduct the carcass searches.

Fatality Documentation

During the set-up for carcass surveys, a sweep survey will be conducted to remove any fatalities that occurred before the study is initiated. These carcasses will be documented in the same manner as those found during the standardized carcasses searches; however, they will not be included in the statistical analysis because the statistical analysis requires a known search interval (i.e. an estimate of when fatalities occurred).

Searchers will assume that carcasses found are a result of turbine collisions unless the cause of death can be clearly attributed to a non-turbine cause. Although an unknown number of fatalities may result from natural predation, disease, or anthropogenic events (e.g., shooting), the condition of the carcasses when found rarely facilitates determining the cause of death.

Carcasses found during standardized carcass searches will be assigned a unique number, and species, sex, age, date, time found, location (Global Positioning System [GPS] coordinate, and

distance/direction from the turbine), condition (e.g., intact, scavenged, feather spot), observer, turbine number, and any comments that may indicate cause of death will be collected. All carcasses will be photographed in situ. Once documented, carcasses will be marked in a standardized fashion (e.g., clipping of primary flight feathers) to indicate they have already been recorded. Carcasses will be left in place unless otherwise specified by Project-specific collection permits, if applicable.

Searchers may discover carcasses incidental to standardized carcass searches (e.g., outside of a search plot or of a scheduled survey date). For each incidentally discovered carcass, the searcher will identify, photograph, and record data for the carcass as would be done for carcasses found during standardized scheduled searches, but will code these carcasses as incidental discoveries. Incidental discoveries will not enter into the statistical calculation of fatality rate for reasons noted above for carcasses found during initial set-up.

All native birds in North America are protected under the MBTA and cannot be salvaged without a permit from the USFWS. In addition to a federal permit, a North Dakota Scientific Collection permit is needed from NDGF to handle native wildlife. This plan assumes that bird carcasses will be left in place and will not be salvaged unless otherwise directed by the appropriate agencies after discovery. If the carcass of a federally listed species is found, searchers will follow procedures identified within Brady Wind's Wildlife Response and Reporting System.

Bias Correction Trials

Carcass persistence time estimates the amount of time a carcass remains on-site prior to its disappearance from the search area due to scavenging or other means (e.g., due to forces such as wind and rain or decomposition beyond recognition). The objective of the carcass persistence trials is to document the length of time carcasses remain in the search area. Carcass persistence trials will be conducted in multiple seasons to evaluate seasonal differences in carcass persistence (i.e. due to changes in scavenger population density or type) and possible differences in the size of the animal being scavenged.

Carcasses used in the trials will be selected to represent a range of species sizes, including bats. For large birds, carcasses may include domestic waterfowl, pheasant, or similar species legally obtained from game farms. For small birds and bats, carcasses may include European starlings, house sparrows, or other non-native species not legally protected. For bats, we may also use mice.

Assuming adequate carcass availability, one carcass persistence trial will be conducted during each of the spring, summer, and fall/winter seasons with at least 15 carcasses of each bird size class (large bird, small bird, and bat) placed per season.

Each carcass used for the carcass persistence trial will be placed randomly within the area used for the trials. Random locations will be generated and loaded into a GPS as waypoints to allow the accurate placement of the carcasses by field personnel. Carcasses will be dropped from waist height and allowed to land in a random posture. Each trial carcass will be discreetly marked (e.g., small tag or wire wrapped around one leg) 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 will monitor the trial carcasses on days 1, 2, 3, 4, 7, 10, 14, 21, and 30. When checking the carcass, searchers will record the condition as intact (normal stages of decomposition), scavenged (feathers pulled out, chewed on, or parts missing), feather spot (only feathers left), or gone (cannot be found). Changes in carcass condition will be cataloged with pictures and detailed notes; photographs will be taken at placement and any time major changes have occurred. At the end of the 30-day period, any evidence of carcasses that remain will be removed and properly disposed of.

Estimates of the probability that a carcass persisted between search intervals and therefore was available to be found by searchers, will be used to adjust carcass counts for bias using methods presented in Huso 2011 or similar analysis method. To date, Huso (2011) presents the most bias-free equation for determining the average probability of persistence, which takes into account the length of the search interval and the carcass persistence time:

$$\hat{r} = \frac{\hat{\bar{t}}(I - e^{-I/\hat{\bar{t}}})}{I}$$

Where t is the estimated mean persistence time and I is the length of the interval. A bootstrapped estimate and 90 percent confidence interval will be calculated based on 5,000 iterations for carcass persistence time. Bootstrapping is a statistical re-sampling procedure where the data are re-sampled with replacement to obtain an estimate and confidence interval.

Searcher Efficiency Trials

The ability of searchers to detect carcasses is influenced by a number of factors including the skill of an individual searcher in finding the carcasses, the vegetation composition within the search area, and the characteristics of individual carcasses (e.g., body size, color). The objective of searcher efficiency trials is to estimate the percentage of bird and bat fatalities that searchers are able to find. Estimates of searcher efficiency are then used to adjust carcass counts for detection bias. Searcher efficiency trials will be conducted in all seasons to account for seasonal differences in searcher efficiency. Carcass species used in the trials and marking and placement techniques will be the same as those in the carcass persistence trials.

Searcher efficiency trials will begin when standardized carcass searches start. Personnel conducting the searches will not know when trials are conducted or the location of the efficiency-trial carcasses. Trials will be conducted multiple times throughout each season and will incorporate testing of each member of the field crew. Assuming adequate carcass availability, at least 15 carcasses of each bird size class (large bird, small bird, and bat) will be placed per season for searcher efficiency trials. A minimum of 10 carcasses per size and season are needed to estimate searcher efficiency. Searcher efficiency trials will be conducted at the monitored turbines. The number of carcasses placed prior to the search (i.e. the number available for detection during each trial) will be verified immediately after the trial by the person responsible for distributing the trial carcasses. Any carcasses not found by searchers will be collected after the trial.

The probability of a carcass being observed is expressed as p, the proportion of trial carcasses that are detected by searchers in the searcher efficiency trials. The probability will be estimated by carcass size class (large bird, small bird, bat) and season. A bootstrapped estimate and 90 percent confidence interval will be calculated based on 5,000 iterations for searcher efficiency.

Fatality Rate Estimation

To calculate the Project-wide fatality rate (fatalities/turbine/year and fatalities/MW/year) and the total Project fatalities, the Huso estimator (Huso 2011) or other appropriate statistical methods will be used. The fatality rate can be calculated for subgroups, including large birds, small birds, raptors (including eagles), bats, or sensitive species (including BCC and state species of conservation priority) if at least 5 fatalities within the subgroup are found.

The estimation of fatality rates will incorporate fatalities documented during standardized carcass searches adjusted for bias. Specifically, fatality estimates will take into account:

- Search interval;
- Observed number of carcasses found during standardized searches during the monitoring year for which operation of the facility cannot be ruled out as the cause of death;
- Carcass persistence, expressed as the probability that a carcass is expected to remain in the study area (persist) and be available for detection by the searchers during carcass persistence trials; and
- Searcher efficiency, expressed as the probability of trial carcasses found by searchers during searcher efficiency trials.

The Huso estimator (2011) uses the following equation to estimate fatalities:

$$\hat{f}_{ijk} = \frac{c_{ijk}}{\hat{p}_{jk*}\,\hat{r}_{jk*}\,\hat{v}_{jk}}$$

Where f^_ijk is the estimated fatality at the ith turbine during the jth search in the kth category and cijk is the observed number of carcasses at the ith turbine during the jth search in the kth category. The variable r^_jk is a function of the average carcass persistence time, which was described earlier, and the length of the search interval preceding a carcass being discovered. The variable r^_jk is calculated using the lower value of I, the actual search interval when a carcass is found or (I,)˜ ^the effective search interval, and is estimated through searcher efficiency trials previously described. v^_jk is the proportion of the effective search interval sampled where v^= min (1, Ĩ⁄I). p^_jk is the estimated probability that a carcass in the kth category that is available to be found will be found during the jth search. The variables p^_(jk,) r^_(jk,) and v^_jk are assumed not to differ among turbines but can differ with carcass type, size class, and season. To obtain an estimate of the number of fatalities per turbine the following equation is used:

$$\hat{f} = \frac{\sum_{i=1}^{u}\sum_{j=1}^{n_i}\sum_{k=1}^{2}\hat{f}_{ijk}}{t}$$

Where ni is the number of searches at turbine i (i = 1…u) and t is the effective number of turbines searched. A bootstrapped estimate and 90 percent confidence interval will be calculated based on 5,000 iterations for the fatality estimate. The 90 percent confidence interval represents the upper and lower bounds of the range of fatality rates that has a 90 percent probability of containing the true fatality rate. The 90 percent confidence interval is useful in a management context as a means of assessing the range of fatality rates that are probable given the number of carcasses that were detected. It should be noted that the upper 90 percent confidence limit corresponds to 95 percent probability that the true fatality rate is lower than the upper 90 percent confidence limit.

Appendix C: Wildlife Response and Reporting System

NextEra Energy Resources

Wildlife Response and Reporting System Manual for the Brady Wind Energy Center

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Purpose

The purpose of this Wildlife Response and Reporting System (WRRS) manual is to standardize the actions taken in response to any wildlife fatalities and/or injuries found within the wind plant boundaries. Training will be performed by qualified consultants or in-house environmental staff qualified to conduct the training.

Any wildlife incident found within wind plant boundaries, regardless of cause of death, should be reported immediately to the on-duty Plant Lead/Site Supervisor who shall complete an incident report and take photographs. The Wind Fleet Wildlife Program Manager shall be notified and further actions will be determined at that time based on the species and the circumstances surrounding the incident.

Any federally threatened or endangered species (Appendix C of the WCS) should immediately be reported to the U.S. Fish and Wildlife Service (USFWS) – North Dakota Ecological Services Field Office at (701) 250-4481 and the USFWS Office of Law Enforcement, Mountain-Prairie Region at (303) 236-7540. If a whooping crane is observed, all turbines shall be curtailed according to NextEra's Whooping Crane Curtailment Procedure, for which a specific training will be administered to all employees. Refer to the Brady Wildlife Conservation Strategy (WCS) for further details regarding whooping cranes.

NextEra Contacts

Facility Site Manager
Chase Dauenhauer (701) 794-3716
NextEra Energy Wind Operation Contacts
Jim Lindsay, Wildlife Program Manager Office: (561) 691-7032 Cell: (561) 329-1296
Brian Wysong, Juno Environmental Services, Wildlife Office: (561) 691-2935 Cell: (561) 319-5202

Regulatory Agency Contacts

US Fish and Wildlife Service – North Dakota Ecological Services Field Office
Kevin Shelley, State Supervisor 3425 Miriam Ave. Bismarck, ND 58501 Office: 701.250.4402 Mobile: 701.989.4233
North Dakota Game and Fish Department
John Schumacher 101 N. Bismarck Expressway Bismarck, ND 58501-5095 Phone: 701-328-6300

USFWS Office of Law Enforcement
Resident Agent in Charge
County Sheriff Department
Stark County Sheriff, (701) 456-7610

Inspections

The NextEra Energy Resources Wildlife Response and Reporting System relies solely on wind technicians and other site personnel to find and report birds, bats and other animals. Wildlife Inspections shall be completed as part of the Inspection of Watch (IOW) procedure.

Wildlife inspections must be conducted in accordance with our lease/easement agreements with individual landowners. Confirm these conditions prior to conducting any wildlife inspections. Consult with the PGD Environmental for guidance if a 150-foot radius around turbines is not available for inspection, or if damage to crops or other landowner property could occur during the inspection. Do not trespass or damage property.

CRITICAL SUCCESS FACTORS:

- Ability to safely and legally walk the terrain around the wind turbine
- Awareness of animals or signs of animals on site property
- Ability to recognize when an animal is in distress
- Ability to immediately contact on-site environmental specialist/ PGD Environmental/ Juno Environmental Services (JES) to report the find
- Ability to ensure full compliance with any permit requirements, if any
- Knowledge of procedures for inspections and reporting

INSPECTION PROCEDURE:

1. Upon arrival at the turbine complete all safety requirements. Please be aware of special on site hunting seasons while performing the inspections. This includes Risk Assessment Mitigation Forms (RAMF). Put on all applicable personal protective equipment (PPE). Remember that if at any time you feel your safety is compromised, **DO NOT** complete the Inspection. Beware of uneven walking surfaces, snake hazards, or other potential risks.
2. A complete Wildlife Inspection consists of three “Inspection Circles” that shall be walked. Each Inspection Circle consists of slowly walking around the turbine, scanning the ground as you walk, looking to the right and left, and checking on any suspicious objects in the distance. End “Inspection Circle” where you began.
3. To complete the first circle: Begin at the base of the turbine, walk away from the turbine 30 feet and complete one full Inspection Circle (see step 2) keeping 30 feet from the turbine. A good estimate of distance is 1 long step = 1 yard (3 feet).

4. To complete the second circle walk out another 60 feet, and complete another Inspection Circle; keeping 90 feet away from the turbine.
5. To complete the third and final circle, walk out another 60 feet and complete another Inspection Circle keeping 150 feet from the turbine.
6. When the last circle is completed, answer the appropriate questions on the IOW checklist.
7. Immediately notify the WSM if an animal is found, and then continue with the Reporting Procedures.
8. The IOW checklist shall be synced by the end of the day and accessible via the IOW dashboard.
9. All wildlife fatalities or injuries found during wildlife inspections shall be reported following the site procedures. Ensure a full report is submitted to the appropriate Wildlife Program Manager using the SharePoint application (PGD Applications; common applications; Wildlife Response and Reporting System). See section 2.2.

On-Site Wildlife Fatality Response

Any person(s) on site discovers a wildlife fatality. What constitutes a reportable fatality?

In addition to any complete or partial carcasses, any portion of a bird, bat, or other animal, including individual feathers and/or bones, are all considered reportable wildlife finds. Report all finds even if the carcass and/or parts are not thought to be associated with a wind plant operations. All wildlife species shall be reported.

If a fatality is found, do the following:

Immediately contact the Plant Lead/Site Supervisor. Be prepared to provide the following information:

Examples:

a) Report type: **Fatality**
b) Find description: **Pile of feathers and leg**
c) Species, if known: **Red-tailed Hawk**
d) Location of find: **30ft west of tower 22**

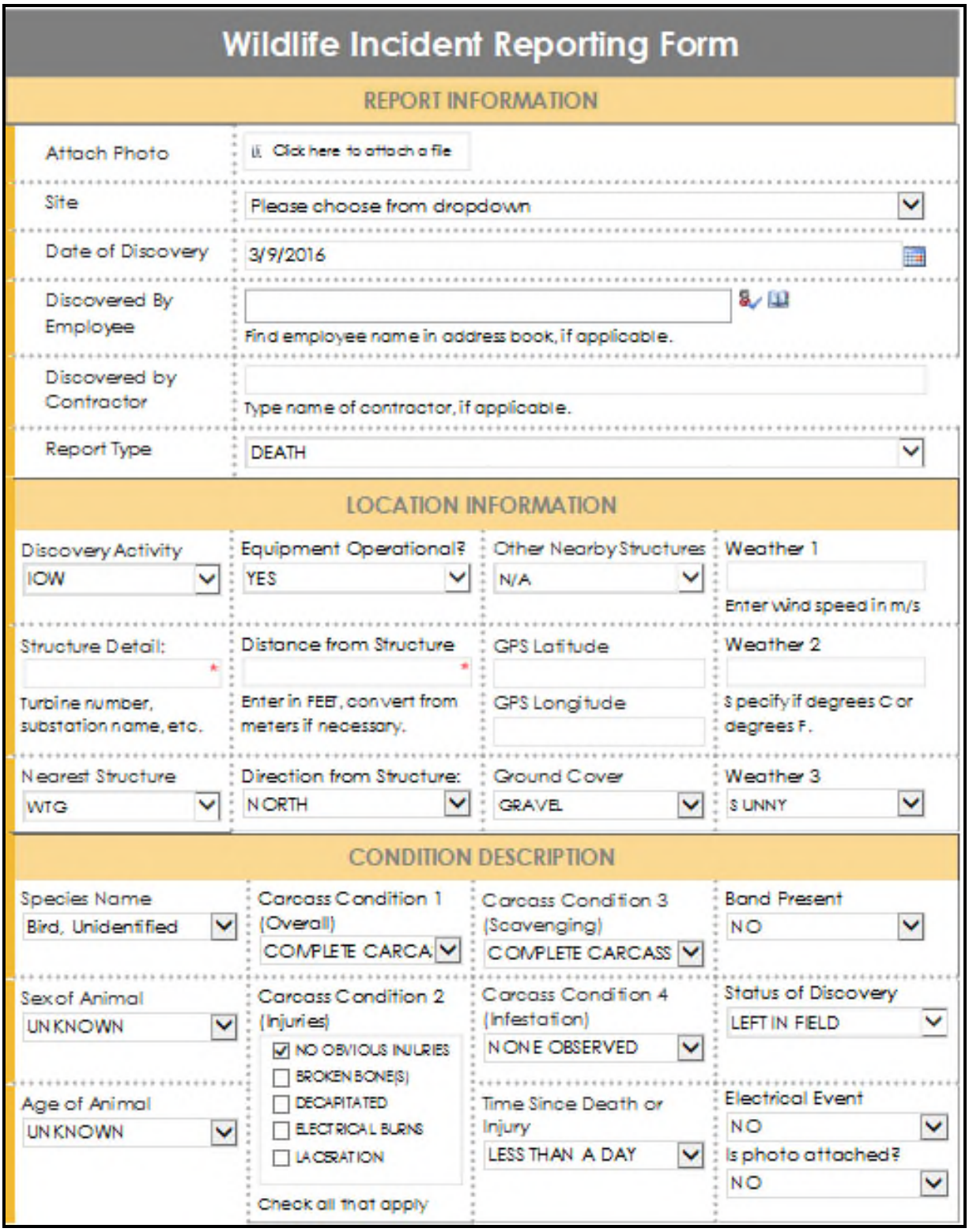
Notify the appropriate Wildlife Program Manager and submit reporting forms and pictures. If a dead or injured whooping crane is found, immediately contact the USFWS-North Dakota Field Office and the USFWS Office of Law Enforcement.

Incident Reports

Every individual animal discovery requires a separate Wildlife Incident Report. Answer every question and include any additional information that may be helpful. Too much information is better than not enough. All questions shall be answered, even if the answer is “unknown.”

The incident report should include at least one photograph of the discovery. Photographs should show a close up of the head and/or feet, as well as the carcass in relation to the closet structure, if possible. A common item placed next to, but not touching the carcass, helps indicate the size of the animal.

Below is a screenshot of the Wildlife Incident Reporting Form. Fields with a red asterisk * are required.



Wildlife Incident Reporting Form

REPORT INFORMATION

Attach Photo	Click here to attach a file
Site	Please choose from dropdown
Date of Discovery	3/9/2016
Discovered By Employee	Find employee name in address book, if applicable.
Discovered by Contractor	Type name of contractor, if applicable.
Report Type	DEATH

LOCATION INFORMATION

Discovery Activity: IOW	Equipment Operational? YES	Other Nearby Structures: N/A	Weather 1: Enter wind speed in m/s
Structure Detail: Turbine number, substation name, etc.	Distance from Structure: Enter in FEET, convert from meters if necessary.	GPS Latitude / GPS Longitude	Weather 2: Specify if degrees C or degrees F.
Nearest Structure: WTG	Direction from Structure: NORTH	Ground Cover: GRAVEL	Weather 3: SUNNY

CONDITION DESCRIPTION

Species Name: Bird, Unidentified	Carcass Condition 1 (Overall): COMPLETE CARCA	Carcass Condition 3 (Scavenging): COMPLETE CARCASS	Band Present: NO
Sex of Animal: UNKNOWN	Carcass Condition 2 (Injuries): ☑ NO OBVIOUS INJURIES; ☐ BROKEN BONE(S); ☐ DECAPITATED; ☐ ELECTRICAL BURNS; ☐ LACERATION. Check all that apply	Carcass Condition 4 (Infestation): NONE OBSERVED	Status of Discovery: LEFT IN FIELD
Age of Animal: UNKNOWN		Time Since Death or Injury: LESS THAN A DAY	Electrical Event: NO; Is photo attached?: NO

FINDS WITH BANDS

If you find a wildlife fatality with a band(s) (sometimes found in or around legs, ears or wings of animals), please notify your Wildlife Program Manager, and include this information in your WRRS reporting form. There are several different wildlife and agencies that may need to be contacted.

NESTS

If you find a nest in, on or around a turbine, power pole, substation, or transformer, please contact your Wildlife Program Manager for guidance. Do not remove or touch a nest without permission. Please note that a bird nest could be a collection of eggs with no nesting material below them (barn owl nests, for example).

On-Site Wildlife Injury Response

The majority of injured birds will have a broken wing. A broken wing will usually hang down oddly or blow in the wind. An injured bird will most likely be on the ground and unwilling or unable to fly. Raptors (any bird of prey or bird with a hooked beak and sharp talons) will sometimes perch on the ground and raptors will sometimes walk on the ground, but not often. If a bird is seen walking or perched on the ground, approach it slowly to see if it will fly away, if it runs away, refusing to fly, it is most likely injured.

Injured animals are dangerous. PGD prohibits personnel from getting too close or touching any wildlife without prior regulatory or PGD approval. This practice is enforced to avoid potential injury to self and to wildlife. Prior to completing any inspection related tasks or the collection of information needed for a report, conduct a risk assessment to define potential risks (e.g., uneven walking surfaces, snakes, etc.). Once safety is assessed, maintain visual contact with the injured animal while reporting the incident to the Wind Site Manager or Wildlife Program Manager so that the correct process can be determined.

Injured Wildlife Reporting Procedure

If you find injured wildlife, immediately notify the on-site respondent. The Wildlife Program Manager will notify the USFWS North Dakota Field Office and the Office of Law Enforcement. A Wildlife Incident Reporting form shall be filled out. DO NOT DISTURB THE FIND unless you have a special permit to do so. Do not touch or move it.

If notified of an animal injury, respond immediately and follow these steps:

1. Observe animal and try to assess injuries.
2. Photographs should be taken if possible. Photographs of injured animals are not a priority; everyone's safety and the animal's condition are more important. If photos are taken try to include the following:
    a. The position of the bird/animal in relation to any and all structures nearby.

b. All injuries or possible injuries.

3. If the injured animal is a bird, immediately contact the USFWS-North Dakota Field Office and the USFWS Office of Law Enforcement. Any federally- or state-listed species should immediately be reported to the USFWS-North Dakota Field Office and the USFWS Office of Law Enforcement. Refer to the Brady WCS for further details regarding the whooping crane.
4. If directed to do so and the Project obtained the proper permits, transport animal to nearby rehabilitation center or vet clinic. Any information from the rehabilitation/wildlife care personnel should be noted.
5. If animal was missing any appendages (e.g., a wing was amputated), try to locate missing appendage. If any pieces are found, bag and label with the following information: species, date injured animal was reported, and the nearest structure.
6. Every individual animal requires a Wildlife Incident Reporting form.
7. Answer every question and include any additional information that may be helpful. Too much information is better than not enough.
8. All questions shall be answered, even if the answer is “unknown”.
9. Once the Wildlife Incident Reporting form is completed it shall be emailed along with photographs to the Wildlife Program Manager. The Wildlife Incident Reporting form and photographs shall be submitted immediately.
10. Reporting federally and state-listed injured wildlife will follow the procedures outlined below.

EXTERNAL & INTERNAL NOTIFICATIONS

All wildlife discoveries at NextEra Energy wind sites must be reported internally via the WRRS Incident Report. Once the report is saved, PGD Environmental (PGDE) receives an e-mail notification of the new entry. A review of the entry and information is completed, and changes made at the time. This may include corrected species identification information.

In some cases, notification to Federal or State agencies may be required, if a discovery of an injured or dead eagle, or protected species is made.

Check with your Wind Site Manager to determine the process for landowner or rancher notifications if livestock carcasses are discovered. Livestock notifications should be made to ensure removal of carcasses of cattle or sheep. If an injured sheep or cow is found, a courtesy notification should be made as well.

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GENERAL PROCEDURE

Due to the sensitivity of eagle and federally endangered species fatalities or injuries, it is very important these fatalities or incidents are recorded and reported immediately to the appropriate persons. Discussions and notifications with appropriate persons are critical to determine species, facts and potential risks (legal, operational, media).

1. The Wind Site Manager shall receive all pertinent information regarding incident, e.g., discovery of event, banding information, location, contact person, condition of find, photographs, etc.
2. Once the information is collected, The Wind Site Manager should immediately report to PGD Environmental and enter into the information into the WRRS database. In addition, the WSM should notify the Regional / General Operations Managers, and VP of Wind operations.
3. The Wind Site Manager should contact PGD Environmental for guidance on making notifications, including a determination of what agencies to notify. After this discussion, notifications should be made by the Wind Site Manager by phone or e-mail, whichever is deemed appropriate. The Wind Site Manager should document the date & time of the call, as well the name of the person receiving the report.
4. PGDE shall forward incident details via e-mail to the Division's Regional Business Manager, legal counsel, Juno Environmental Services, and corporate communications personnel. If necessary, PGDE will conference with the appropriate parties to discuss potential implications.