Bird and Bat Conservation Strategy
Dakota Range III Wind Project
Grant and Roberts Counties, South Dakota

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Disclaimer: This document includes Whooping Crane migration use data from the Central Flyway stretching from Canada to Texas, collected, managed and owned by the U.S. Fish and Wildlife Service. Data were provided to WEST, Inc as a courtesy for their use. The U.S. Fish and Wildlife Service has not directed, reviewed, or endorsed any aspect of the use of these data. Any and all data analyses, interpretations, and conclusions from these data are solely those of WEST, Inc.

1.0 INTRODUCTION

1.1 Background and Purpose

Although wind energy facilities utilize a renewable-energy resource, potential impacts to birds and bats may result from their construction and operation. Interactions with wind turbines and the associated infrastructure such as energy transmission, distribution, and substations may result in fatalities or indirect effects that may include displacement or habitat loss. To address these concerns, Dakota Range III, LLC (Dakota Range III) has developed this site-specific Bird and Bat Conservation Strategy (BBCS) for the Dakota Range III Wind Project (Project) in Grant and Roberts counties, South Dakota. This BBCS outlines various processes Dakota Range III has employed and/or will employ to: 1) comply with all state and federal avian and bat conservation and protection laws and regulations applicable to the Project, 2) ensure any effects to avian and bat resources are identified, quantified, and analyzed, and 3) avoid, minimize, and mitigate potential effects consistent with the US Fish and Wildlife Service (USFWS) *Land-Based Wind Energy Guidelines* (WEG; USFWS 2012).

Federal laws and regulations protect the majority of birds found in and around the Project, including the Migratory Bird Treaty Act of 1918 (MBTA), the Bald and Golden Eagle Protection Act of 1940 (BGEPA), and the federal Endangered Species Act of 1973 (ESA). The purpose of this BBCS is to meet the intent of these regulations and guidelines by suggesting methods for reducing and managing the risk to avian and bat species. This BBCS has been voluntarily prepared as a good faith effort by Dakota Range III to address proactively potential impacts to birds and bats that may result from the construction and operation of the Project.

1.2 Objectives

Dakota Range III has developed this BBCS to meet the following objectives:

1) Document and describe the scope of the Project, the biological survey work that was completed during pre-construction, and provide an assessment of risk to avian and bat resources posed by the Project. This objective includes providing a single point of reference, this BBCS, for information related to avian and bat studies performed in relation to the Project.
2) Provide a plan to avoid, minimize, and monitor potential effects to avian and bat species resulting from the construction and operation of the Project consistent with the WEG.
3) Describe post-construction monitoring efforts that will continue to be implemented at the Project to identify impacts to birds and bats, as well as the methods for reporting the results of monitoring.
4) Outline the adaptive management framework Dakota Range III is committed to over the life of the Project, and how they plan to implement adaptive management during operation of the Project.

5) Provide an educational and practical reference for Dakota Range III's employees and contractors to facilitate the application of measures that avoid and minimize potential negative effects to avian and bat species at the Project.

2.0 SITE AND PROJECT DESCRIPTION

The current Project encompasses 18,740 acres (ac; 7,584 hectares; ha) in Grant and Roberts counties (Figure 1) and is located about 26 miles (mi; 42 kilometers; km) north of Watertown, South Dakota. The Project is within the Big Sioux Basin Level IV ecoregion, which is within the larger Northern Glaciated Plains Level III Ecoregion. The Northern Glaciated Plains ecoregion is characterized by high concentrations of seasonal and semi-permanent wetlands (prairie potholes) within fertile glacial till. (US Environmental Protection Agency 2017). The Big Sioux Basin ecoregion is a trough though the Prairie Coteau that differs from the surrounding landscape due to a highly developed drainage system.

The elevation within the current Project ranges from 1,831−2,014 feet (ft; 558−614 meters [m]) above mean sea level. Land ownership is primarily private, with several parcels of Dakota Tallgrass Prairie Wildlife Area and Emergency Watershed Protection Floodplain Easement in the northeast portion of the Project (US Geological Survey [USGS] 2018).

The majority of the lands within the current Project are cultivated crops (67.6%) and herbaceous/grassland (25.5%). All other land cover and use types individually account for less than 4.0% of the Project (Table 1, Figure 2; Yang et al. 2018, Multi-Resolution Land Characteristics [MRLC] 2019). The most common cultivated crops in 2018 were soybeans (*Glycine max*) and corn (*Zea mays*; US Department of Agriculture National Agricultural Statistics Service National Cropland Layer 2018).

Less than 1.0% of the Project is wetlands (USFWS National Wetlands Inventory 2018); the most common wetland type is freshwater emergent, followed by freshwater pond and freshwater forested/shrub wetland (Table 2, Figure 3). The Big Sioux River flows through the main body of the Project; the area of the Project with the transmission line is bisected by the Indian River (USGS National Hydrography Dataset 2018).

Table 1. Land cover and use type coverage in acres and percent composition within the Dakota Range III Wind Project, Grant and Roberts counties, South Dakota.

Land Cover and Use	Acres	Percent Composition
Cultivated Crops	12,668.3	67.6
Herbaceous/Grassland	4,782.0	25.5
Developed	708.8	3.8
Open Water	137.8	0.7
Deciduous Forest	126.2	0.7
Emergent Herbaceous Wetlands	121.8	0.7
Hay/Pasture	111.7	0.6
Barren Land	63.1	0.3
Mixed Forest	17.3	<0.1
Woody Wetlands	1.1	<0.1
Evergreen Forest	0.7	<0.1
Shrub/Scrub	0.7	<0.1
Total[a]	**18,739.7**	**100**

Data Source: Yang et al. 2018, Multi-Resolution Land Characteristics 2019.

[a] Sums of values may not add precisely to total value shown due to rounding.

Table 2. Wetland types, coverage in acres, and percent composition, within the Dakota Range III Wind Project, Grant and Roberts counties, South Dakota.

Wetland Type	Acres	Percent Composition
Freshwater Emergent Wetland	106.6	65.7
Freshwater Pond	54.5	33.6
Freshwater Forested/Shrub Wetland	1.2	0.7
Total[a]	**162.3**	**100**

Data source: US Fish and Wildlife Service National Wetlands Inventory 2018.

[a] Sums of values may not add precisely to total value shown due to rounding.

3.0 REGULATORY REQUIREMENTS RELEVANT TO THIS BBCS

Following the WEG, this BBCS is considered a “living document” and as such may be updated as warranted during operation of the Project. The updates may be in response to changed circumstances regarding species of interest, levels of impact, or modifications to laws and acts. At all times the Project will follow all regulatory requirements that have jurisdiction over the Project.

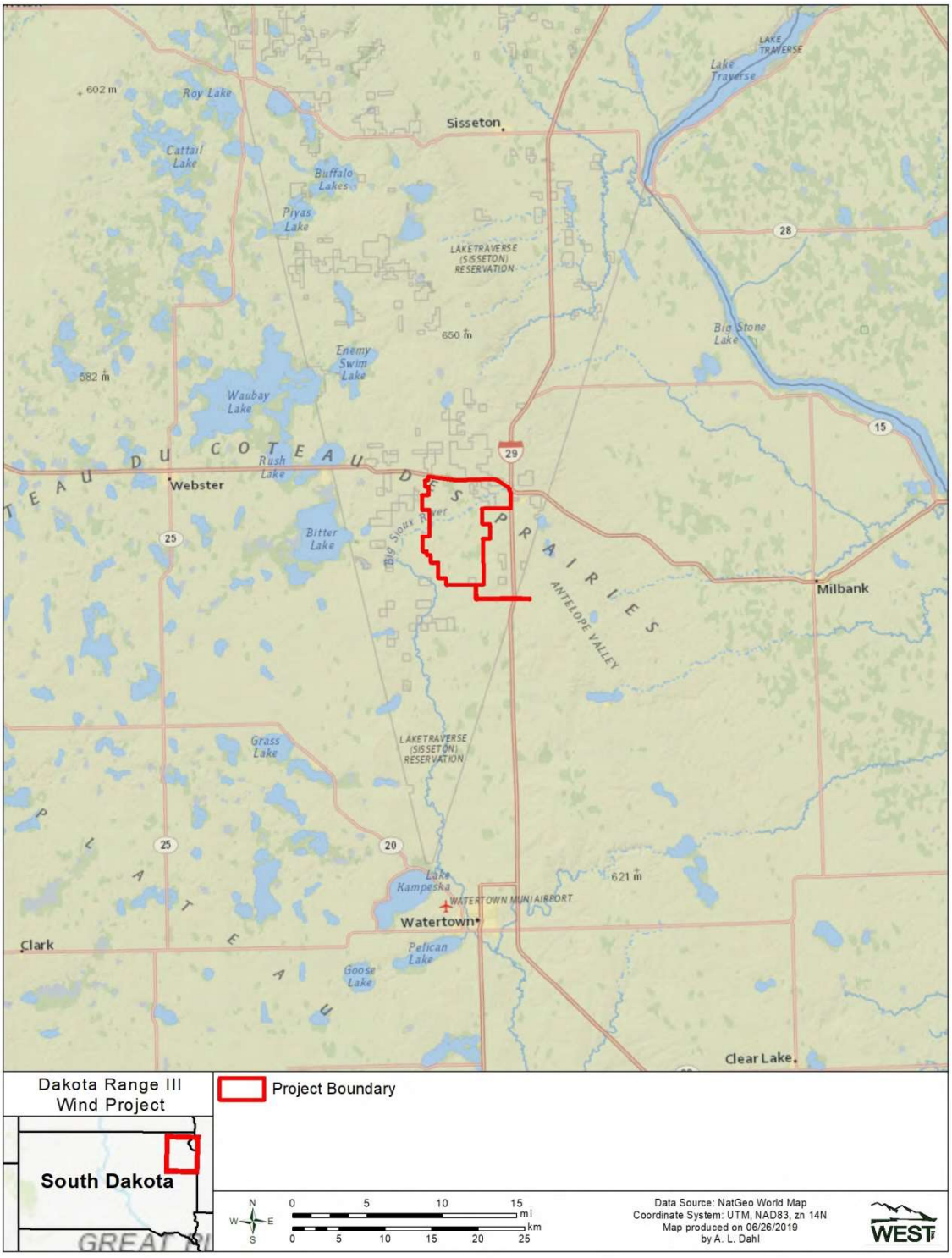

Figure 1. Location of the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

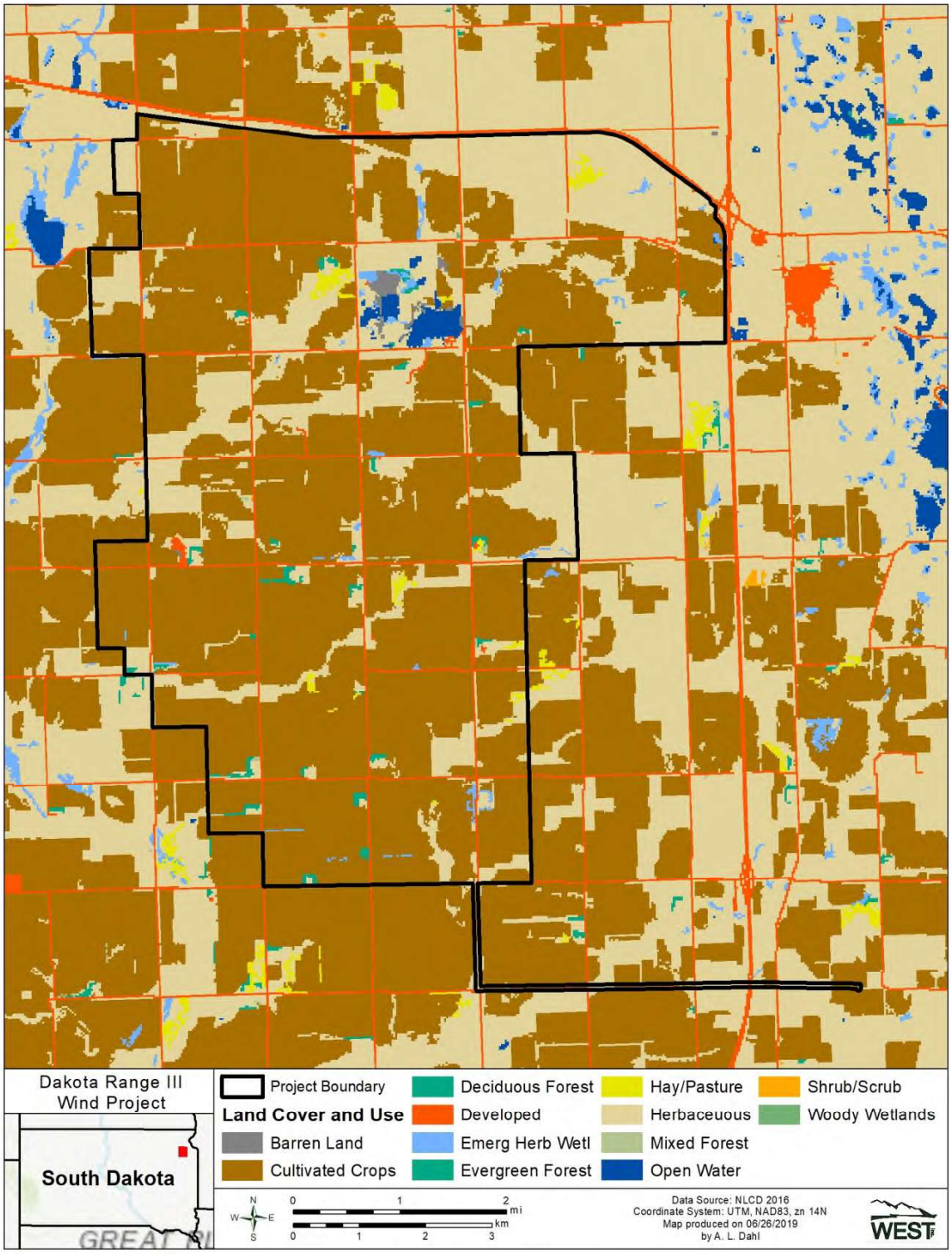

Figure 2. Land cover and use types within the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota (Yang et al. 2018, Multi-Resolution Land Characteristics 2019).

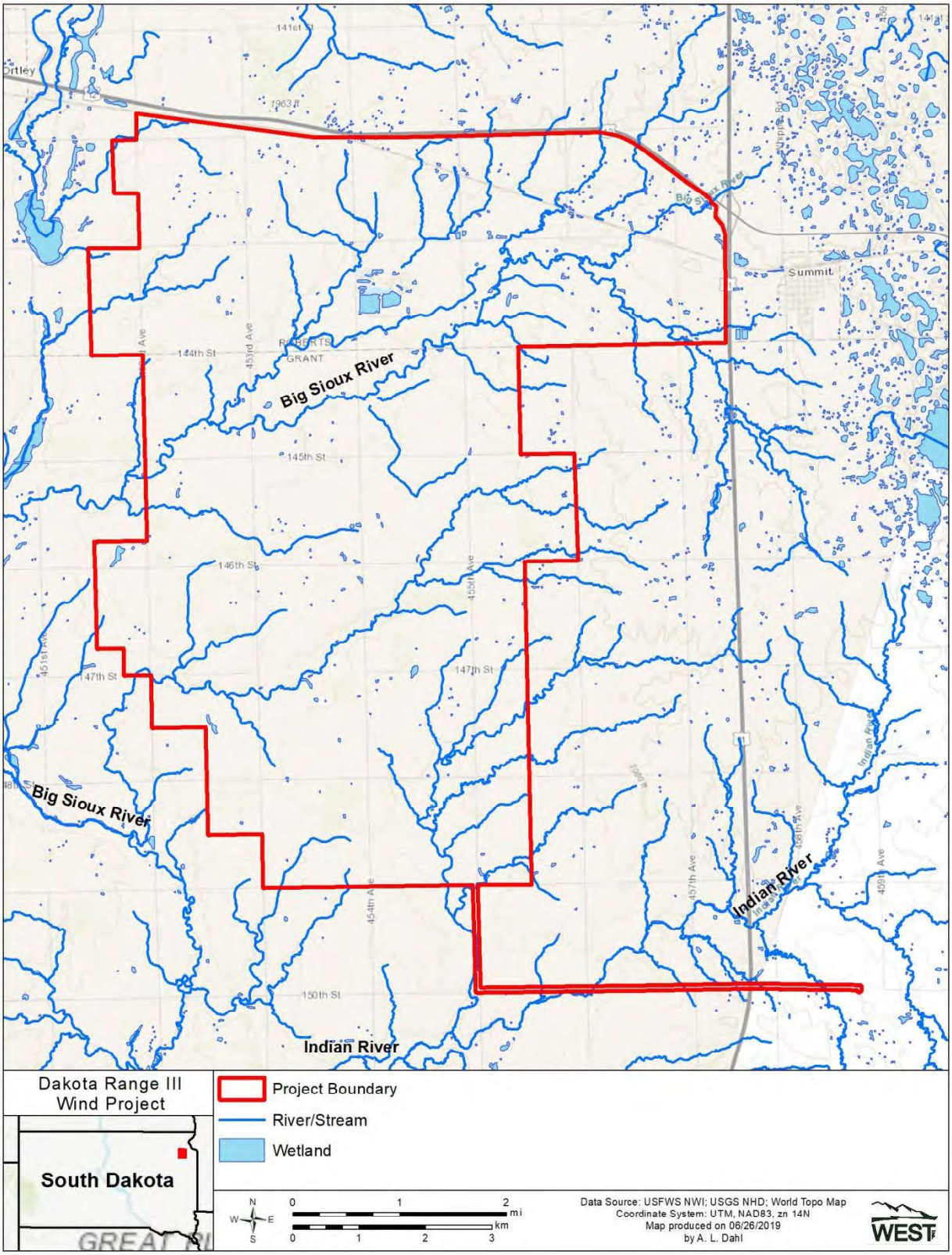

Figure 3. Wetlands, rivers, and streams within the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

3.1 Federal Endangered Species Act

Species at risk of extinction, including many birds and bats, are protected under the federal ESA of 1973, as amended (16 United States Code [USC] §§ 1531 *et seq*. [1973]). The purpose of the ESA is to protect threatened and endangered species and to provide a means to conserve their habitats. "Take" under the ESA is defined as "…to harass, harm, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." (ESA § 3(19) [1973], 16 USC 1532(19) [1973]). "Harm" is an act, which injures or kills a wildlife species, including significant habitat modification or degradation; whereas "harass" is defined as an intentional or negligent act or omission, which creates the likelihood of injury by annoying the animal to the extent it significantly disrupts normal behavior patterns such as breeding, feeding, or sheltering. The ESA authorizes the USFWS to issue permits for "incidental take" of wildlife species, which is take resulting from an otherwise lawful activity.

3.2 Migratory Bird Treaty Act

The MBTA integrates and implements four international treaties that provide for the protection of migratory birds. The MBTA prohibits the "taking, killing, possession, transportation, import and export of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior." (16 USC § 703 [1918]). 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 Code of Federal Regulations [CFR] § 10.12 [1973]). The USFWS maintains a list of all species protected by the MBTA at 50 CFR § 10.13 (1973). This list includes over 1,000 species of migratory birds, including eagles and other raptors, waterfowl, shorebirds, seabirds, wading birds, and passerines.

On December 22, 2017, the US Department of Interior issued a Solicitor's Opinion (2017) followed by the USFWS Guidance Memorandum on April 11, 2018 (USFWS 2018a), both of which clarified the following with regards to enforcement of the MBTA: 1) the MBTA's take prohibitions only apply when the purpose of an action is take of migratory birds, their eggs, or their nests, 2) the project's impacts on migratory birds should still be considered during the National Environmental Policy Act of 1969 review process, 3) future settlement agreements for take of listed species or eagles should not include restrictions, minimization measures, or mitigation for purposes of MBTA compliance, 4) future permits under the ESA or BGEPA, or inter-agency consultations under Section 7 of the ESA, should not include restrictions, minimization measures, or mitigation for purposes of MBTA compliance, and 5) the MBTA does not affect protections provided under the ESA or the BGEPA (Locke Lord 2018).

3.3 Bald and Golden Eagle Protection Act

The BGEPA (16 USC §§ 668-668d [1940]) affords bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) additional legal protection. The BGEPA prohibits the take, sale, purchase, barter, offer of sale, 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. The BGEPA also defines "take" to include "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or

disturb," (16 USC § 668c [1940]), and includes criminal and civil penalties for violating the statute (16 USC § 668 [1940]). The USFWS further defined the term "disturb" as agitating or bothering an eagle to a degree that causes, or is likely to cause, injury, or either a decrease in productivity or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior.

In September of 2009, the USFWS promulgated a final rule on two new permit regulations that specifically authorize under the BGEPA the non-purposeful (i.e., incidental) take of eagles and eagle nests in certain situations (50 CFR § 22.26 [2009] and § 22.27 [2009]). Revisions to the final rule were issued in December of 2016. The permits authorize limited take of bald and golden eagles; authorizing individuals, companies, government agencies and other organizations to disturb or otherwise take eagles in the course of conducting lawful activities. To facilitate issuance of Eagle Take Permits (ETPs) for wind energy facilities, the USFWS finalized the *Eagle Conservation Plan Guidance* (ECPG) - *Module 1 - Land-based Wind Energy Version 2* (USFWS 2013a). If eagles are identified as a potential species at risk, developers are encouraged to follow the ECPG. The ECPG describes specific actions recommended to achieve compliance with the regulatory requirements in the BGEPA for an ETP, as described in 50 CFR § 22.26 [2009] and § 22.27 [2009]). The ECPG provides a national framework for assessing and mitigating risk specific to eagles through development of Eagle Conservation Plans and issuance of programmatic ETPs for eagles at wind facilities.

3.4 South Dakota Game, Fish and Parks Siting Guidelines for Wind Power in South Dakota

The Siting Guidelines for Wind Power Projects in South Dakota (South Dakota Game, Fish and Parks [SDGFP] 2012) address activities and concerns associated with siting and permitting wind turbines in South Dakota. The guidelines highlight the Missouri Coteau in central South Dakota, where the Project area is located, and the Coteau des Prairies in eastern South Dakota as areas identified as potential sites for wind development in South Dakota. These guidelines also contain contact information for state agencies, wildlife experts and universities, interest groups, and local resource management agencies (SDGFP 2012).

4.0 AGENCY CONSULTATION

The WEG strongly encourages energy developers to coordinate with agencies to obtain information on bird, bat or other wildlife issues within a project area and vicinity. Agencies can help developers identify potential biological resource issues early in the development process. Dakota Range III held several meetings to discuss survey methodology and results with state and federal wildlife agencies to help inform designed and review of the Project data in accordance with the WEG.

5.0 AVIAN AND BAT RESOURCES: TIERS 1−3

The WEG outlines a tiered approach that assesses the habitat suitability and risks to wildlife at a potential wind resource area. The "tiered" approach ensures sufficient data are collected to enable project proponents to make informed decisions about continued development of a proposed project (USFWS 2012). At each tier, potential issues associated with the development or operations of the project are identified and questions are formulated to guide the decision process. This process starts at a broad scale and provides more site-specific detail at each tier as more data are gathered and the potential for avian and bat issues are better understood. This approach ensures sufficient data are collected to enable Dakota Range III to make informed decisions regarding the Project while ensuring Dakota Range III is complying with its corporate environmental policy.

5.1 Tiers 1 and 2 – Preliminary Site Evaluation and Characterization

As described in the WEG, Tiers 1 and 2 provide a framework for evaluating potential issues that may need to be addressed before further actions can be taken relative to the development or operations of the Project. Tier 1 and 2 studies provide a preliminary desktop evaluation or screening of public data from federal, state, and tribal entities and offer early guidance about the sensitivity of the site, in regards to flora and fauna, including listed species.

Tier 2 studies typically include a more substantive review of existing information than Tier 1 efforts, including publicly available data on land use/land cover, topography, wetland data, wildlife, habitat, and sensitive plant distribution, a reconnaissance level site visit (to confirm presence of habitat types), and making first contact with agencies involved. Tier 2 studies were not previously conducted. Therefore, a desktop analysis based on information compiled from publicly available sources was used to inform the potential risk of the proposed Project to species of concern, and to address the issues identified in the Tier 2 questions below.

5.1.1 Tier 2 Questions

1. Are known species of concern present on the proposed site, or is habitat (including designated Critical Habitat) present for these species?

Federally Listed Species

Four federally listed (ESA 1973) bird and bat species have the potential to occur in the Project (Table 3). These species include the piping plover (*Charadrius melodus*; threatened), rufa red knot (*Calidris canutus rufa*; threatened), whooping crane (*Grus americana*; endangered), and northern long-eared bat (*Myotis septentrionalis*; threatened).

There is no bird or bat Critical Habitat within the Project (USFWS 2017a); the closest bird or bat Critical Habitat is for the piping plover and it is located more than 100 mi (161 km) to the northwest of the Project. While not a bird or bat, the threatened Dakota skipper (*Hesperia dacotae*) and endangered Poweshiek skipperling (*Oarisma poweshiek*) also have the potential to occur in Grant and Roberts counties.

Table 3. Federally endangered or threatened bird and bat species with the potential to occur within the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

Species	Federal Status[1]	Habitat Requirements	Likelihood of Occurrence
Birds			
Piping plover (*Charadrius melodus*)	FT	Barren sandbars in large river systems and on alkaline lakeshores.	Possible migrant. Preferred habitat limited within the Project.
Rufa red knot (*Calidris canutus rufa*)	FT	Sandy beaches, mudflats, and exposed areas around wetlands and lakes.	Possible migrant. Preferred habitat limited within the Project.
Whooping crane (*Grus americana*)	FE	Shallow wetlands, various croplands, riverine habitat.	Possible migrant. Potential use of the Project for stopover habitat during migration.
Mammals			
Northern long-eared bat (*Myotis septentrionalis*)	FT	Forested areas, especially old growth and late successional forests where dead and dying trees provide roosting habitat.	Possible. Preferred habitat limited within the Project.

[1.F]E = Federally Endangered, FT = Federally Threatened.

Sources: South Dakota Game, Fish and Parks (SDGFP 2014b, 2019a), South Dakota Birds Birding and Nature 2019, US Fish and Wildlife Service (USFWS 2017b, 2019b), USFWS Information for Planning and Consultation (2019a).

Piping Plover

Piping plovers (federally listed as threatened; 50 FR 50726 [December 11, 1985]) are small shorebirds known to breed in South Dakota. Nesting in South Dakota is primarily restricted to sandbars on the Missouri River (South Dakota Birds 2018a). Plovers also nest in open, sandy areas around alkaline wetlands. There is no record of piping plovers breeding within Grant and Roberts counties (SDGFP 2019a) nor is their preferred nesting habitat known to occur in the Project. It seems unlikely piping plover would breed near the Project. However, the potential exists for the species to fly through the area, perhaps during migration (SDGFP 2014b).

Rufa Red Knot

Rufa red knots (federally listed as threatened; 79 FR 73706 [December 11, 2014]) are shorebirds that do not breed in South Dakota (South Dakota Birds 2018b). During migration, they may utilize mud and sand surrounding shallow water. Limited stopover habitat exists within the Project. Therefore, the possibility exists for the red knot to migrate through the Project, although most red knots are coastal migrants (South Dakota Birds 2018b).

Whooping Crane

The whooping crane is a federally listed endangered species (32 FR 4001 [March 11, 1967]) that could occur within the Project during migration. Whooping cranes typically migrate from their breeding grounds in Wood Buffalo National Park, Canada, to their wintering areas in Aransas National Wildlife Refuge, Texas. During the spring and fall migration, the species migrates through Oklahoma, Kansas, Nebraska, North Dakota, and South Dakota (Canadian Wildlife Service and USFWS 2005).

The migration corridor for whooping cranes is based on historical sightings of whooping cranes from the early 1960's through 2016 (Pearse et al. 2018; Figure 4). The corridor encompasses approximately 95% of whooping crane observations considered in the study. The Project is about 25 mi (40 km) outside the main migration corridor (Figure 4). The Project is classified as unoccupied in terms of stopover site use intensity (Pearse et al. 2015; Figure 4); areas classified as low are to the east and west of the Project. Further, the Project is classified as "less likely to occur" in terms of predicted use of the landscape by whooping cranes (Niemuth et al. 2018). As of spring 2018, there were no confirmed observations of whooping cranes within the Project (USFWS Cooperative Whooping Crane Tracking Project (CWCTP) 2018); however, observations have been recorded near the Project, one within about three mi (five km; Figure 4). Whooping cranes could be found in the Project during migration.

Northern Long-Eared Bat

The northern long-eared bat is a federally listed as threatened bat species (78 FR 61046 [October 2, 2013]) whose range includes South Dakota (USFWS 2017c). The northern long-eared bat is generally found in dense forest stands choosing maternity roosts beneath exfoliating bark and in tree cavities, hibernating in caves and mines (Bat Conservation International [BCI] 2019). In South Dakota, the northern long-eared bat is found along the Missouri River and in the Black Hills region (SDGFP 2014b). There is little preferred habitat within the Project, but it is possible the northern long-eared bat could migrate through the area.

State-Listed Species

There are four state-listed bird species with the potential to occur in the Project (Table 4). Two of those, the piping plover (state-threatened) and the whooping crane (state-endangered) have been discussed previously. The osprey (*Pandion haliaetus*; state-threatened) and peregrine falcon (*Falco peregrinus*; state-endangered) may occur within the Project. There are currently no state-protected bat species.

Table 4. State endangered or threatened bird species with potential to occur within the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

Species	State Status[1]	Habitat Requirements	Likelihood of Occurrence
Birds			
Osprey (*Pandion haliaetus*)	ST	Lakes and rivers with fish, tall structures for nesting.	Possible
Peregrine falcon (*Falco peregrinus*)	SE	Far-ranging species generally found along rivers or lakes or in any open habitat with adequate food.	Possible.

Table 4. State endangered or threatened bird species with potential to occur within the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

Species	State Status[1]	Habitat Requirements	Likelihood of Occurrence
Piping plover (*Charadrius melodus*)	ST	Barren sandbars in large river systems and on alkaline lakeshores.	Possible migrant. Preferred habitat limited within the Project
Whooping crane (*Grus americana*)	SE	Shallow wetlands, various croplands, riverine habitat.	Possible migrant. Potential use of the Project for stopover habitat during migration.

[1] SE = State Endangered, ST = State Threatened.

Sources: South Dakota Game Fish and Parks (SDGFP) 2019a, South Dakota Birds 2019, US Fish and Wildlife Service 2019b, SDGFP 2014b.

Bald and Golden Eagles

While not protected by the ESA, eagles are federally protected by the BGEPA. Both golden and bald eagle are likely to use the Project.

Bald eagles have been reported on the boundary of the Project (eBird 2019; Figure 5). There have been numerous sightings within 20 mi (32 km) of the Project. No bald eagles have been reported in the Project (eBird 2019). The bald eagle's preferred nesting and foraging habitats includes open areas, forests, rivers, and large lakes (SDGFP 2019a, 2019b). The species' breeding range extends across much of South Dakota and is concentrated along rivers and large bodies of water (SDGFP 2019b). Similar habitats within the state are used during winter. It is highly likely bald eagles will utilize the Project, possibly for nesting.

One golden eagle was recorded about 17 mi (27 km) to the northeast in 2006 (eBird 2019; Figure 5). No golden eagles have been observed within the Project (eBird 2019). Habitats preferred by golden eagles include open prairie, plains, and forested areas (SDGFP 2014b). Golden eagle pairs nest in high places including cliffs, trees, and human-made structures (SDGFP 2019b). They usually perch on ledges and rocky outcrops and use soaring to search for prey. In South Dakota, golden eagles generally nest west of the Missouri River (SDGFP 2019b). The eagles are rare migrants and winter visitors in the eastern portion of the state. While it is possible for golden eagles to utilize the Project, bald eagles will most likely be the more commonly observed eagle.

US Fish and Wildlife Service Birds of Conservation Concern

The USFWS identifies 29 Birds of Conservation Concern (BCC) within the Prairie Potholes Bird Conservation Region 11 (USFWS 2008) that may occur in the Project (Table 5). These species may or may not be protected by the ESA, South Dakota, or BGEPA, but are included here because a federal agency, the USFWS, has designated them as species of concern.

South Dakota Species of Greatest Conservation Need

The South Dakota Wildlife Action Plan lists 20 bird and two bat Species of Greatest Conservation Need (SGCN) with the potential to occur within the Project (SDGFP 2014a, 2018, 2019c; Table 6).

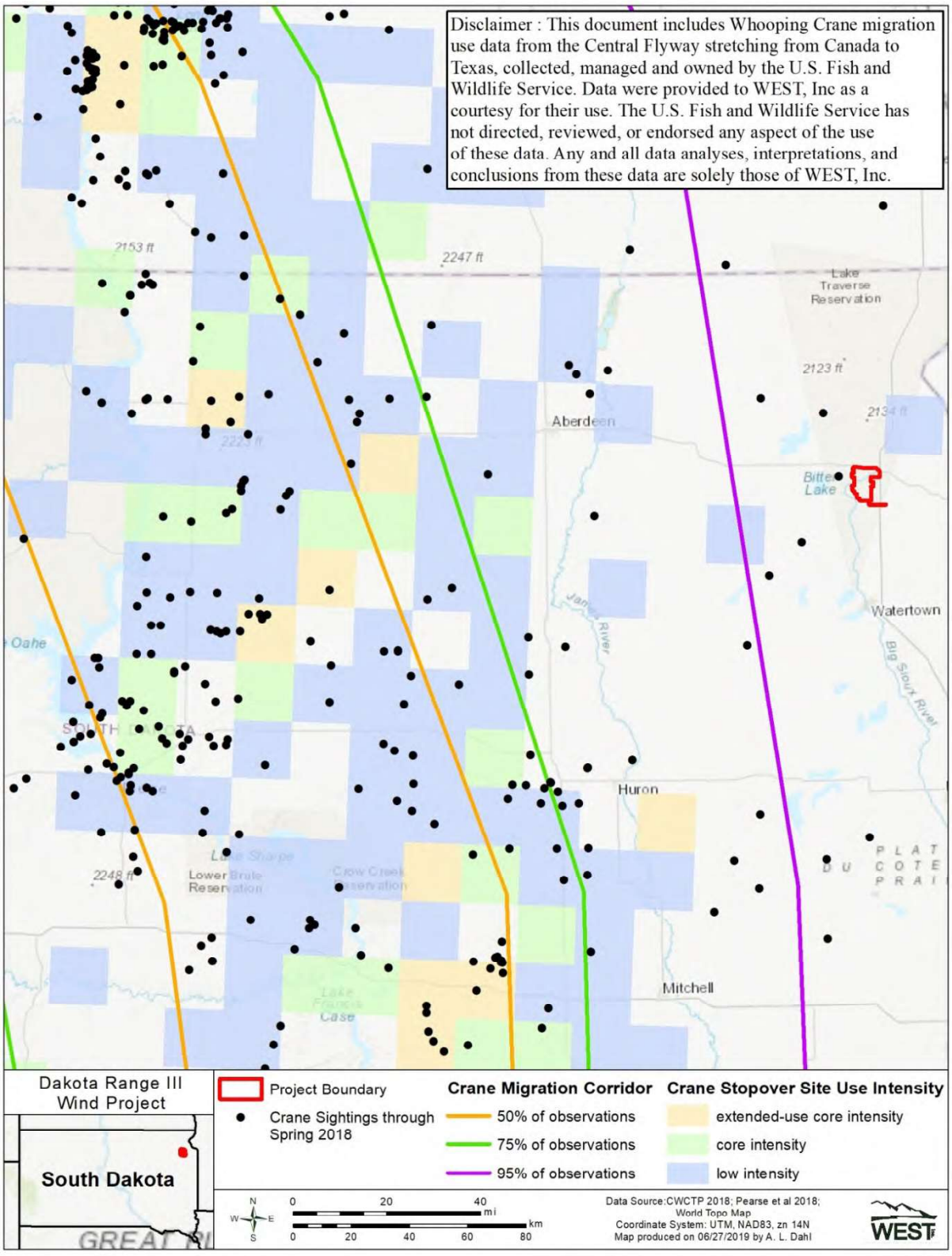

Figure 4. Whooping crane migration corridor, confirmed whooping crane sightings through spring 2018, and stopover site use intensity near the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

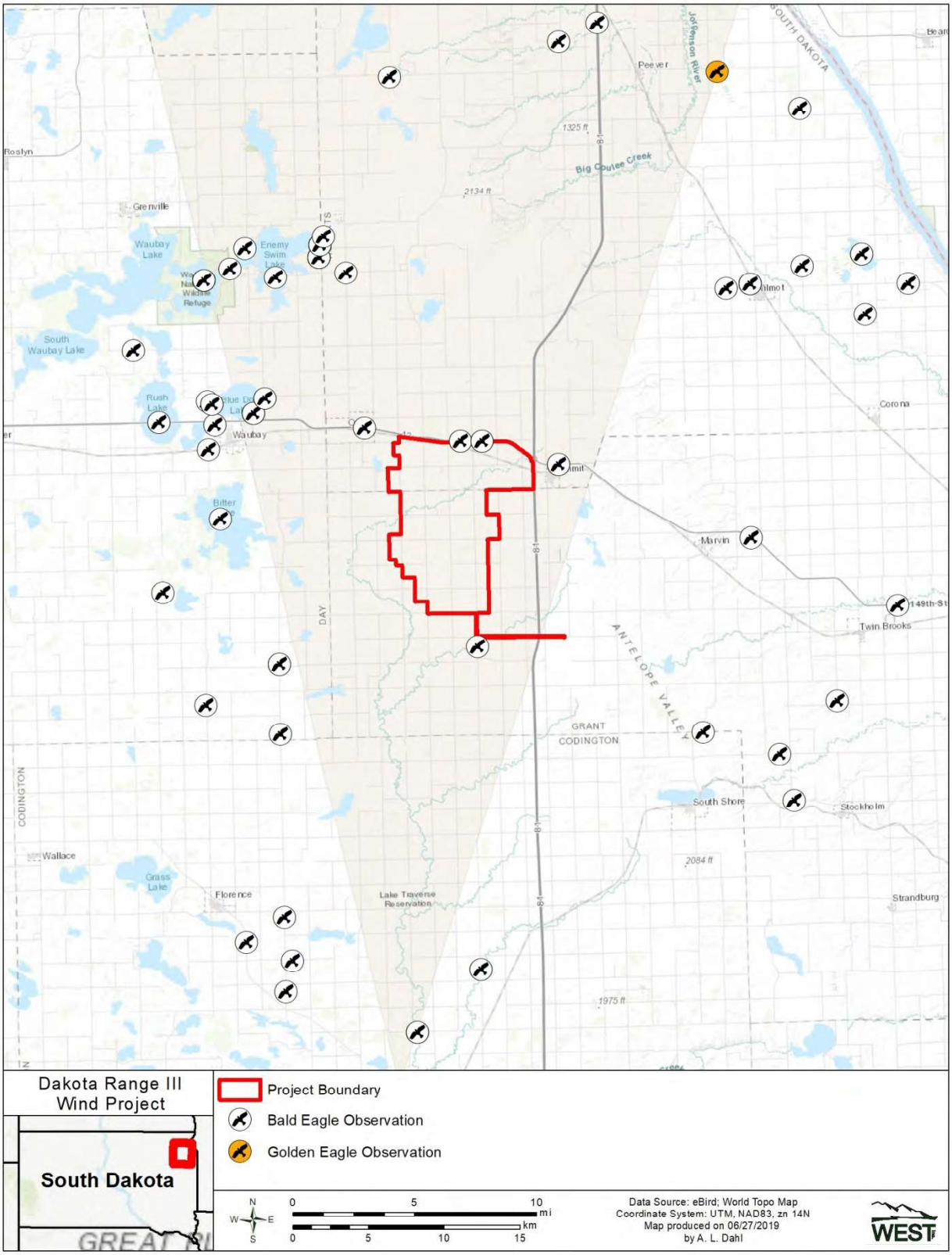

Figure 5. Bald and golden eagle sightings near the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

Table 5. Birds of Conservation Concern (BCC) within the Prairie Potholes Bird Conservation Region 11 with the potential to occur within the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

Species	Habitat Requirements	Likelihood of Occurrence
American bittern (*Botaurus lentiginosus*)	Typically utilizes larger wetlands with tall emergent vegetation.	Possible.
American Golden-plover (*Pluvialis dominica*)	Utilizes grasslands, grazed areas, and mudflats.	Possible migrant.
Baird's sparrow (*Ammodramus bairdii*)	Extensive tracts of native mixed-grass prairie or lightly grazed pasture.	Possible, but unlikely.
Bald eagle (*Haliaeetus leucocephalus*)	Large bodies of water, large mature trees, wide-ranging species.	Probable.
Black tern (*Chlidonias niger*)	Prefer large marshes, wetland complexes with little cultivated cropland.	Probable
Black-billed cuckoo (*Coccyzus erythropthalmus*)	Brushy margins, thickets of small trees and prairie shrubs.	Possible.
Bobolink (*Dolichonyx oryzivorus*)	Older, larger blocks of tall-grass prairie, will use grazed areas and hayed areas.	Possible.
Buff-breasted sandpiper (*Calidris subruficollis*)	Short grasslands during migration.	Probable migrant.
Chestnut-collared longspur (*Calcarius ornatus*)	Grazed or hayed mixed-grass or short-grass prairie.	Probable.
Dickcissel (*Spiza americana)*	Various grasslands, with taller vegetation, forbs, planted hay fields.	Probable.
Dunlin (*Calidris alpina*)	During migration in this region, prefer wetlands with exposed mud.	Possible migrant.
Franklin's gull (*Leucophaeus pipixcan*)	Wetlands with relatively deep water with nearby grasslands and cultivated croplands.	Possible.
Grasshopper sparrow (*A. savannarum*)	Lightly grazed tall- or mixed-grass prairie, shrub land, or hayfields.	Probable.
Hudsonian godwit (*Limosa haemastica*)	Wetland edges with mud, flooded fields.	Possible migrant, but unlikely.
Least bittern (*Ixobrychus exilis*)	Wetlands with tall emergent vegetation such as cattails.	Possible.
Lesser yellowlegs (*Tringa flavipes*)	In this region, will use shallow wetlands during migration.	Possible migrant.
Marbled godwit (*L. fedoa*)	Forages in a variety of wetlands and nests in grazed native prairies.	Probable.
Nelson's sparrow (*A. nelsoni*)	Grassland with tall, dense vegetation with nearby and surrounding wetlands.	Probable.

Table 5. Birds of Conservation Concern (BCC) within the Prairie Potholes Bird Conservation Region 11 with the potential to occur within the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

Species	Habitat Requirements	Likelihood of Occurrence
Peregrine falcon (*Falco peregrinus*)	Far-ranging species generally found along rivers or lakes or in any open habitat with adequate food.	Possible.
Red-headed woodpecker (*Melanerpes erythrocephalus*)	Stands of deciduous trees along river bottoms, shelterbelts, or wooded areas.	Probable.
Ruddy Turnstone (*Arenaria interpres*)	Sandy beaches with shallow water.	Possible migrant, but unlikely.
Semipalmated Sandpiper (*C. pusilla*)	Mudflats, sand beaches, wetland shores	Possible migrant.
Short-billed Dowitcher (*Limnodromus griseus*)	During migration, open bodies of water, flooded fields, and wetland edges.	Possible migrant.
Smith's Longspur (*Calcarius pictus*)	Short grasslands, native short-grass prairie.	Possible migrant.
Solitary Sandpiper (*T. solitaria*)	Almost any habitat with water during migration, wetland edges with mud.	Possible migrant.
Sprague's pipit (*Anthus spragueii*)	Extensive tracts of native, ungrazed or lightly grazed mixed-grass prairie.	Possible migrant.
Swainson's hawk (*Buteo swainsoni*)	Open areas such as prairie or grasslands, trees for nesting.	Probable.
Upland sandpiper (*Bartramia longicauda*)	Native and tame grasslands, wet meadows, hayfields, and pastures predominantly of mixed-grass cover.	Probable.
Willet (*T. semipalmata*)	Short grasslands, prairie, open water wetlands, often ephemeral.	Probable.

Sources: US Fish and Wildlife Service (USFWS) BCC 2008, 2015, Cornell Lab of Ornithology 2015, South Dakota Game, Fish, and Parks 2019a, South Dakota Birds 2019.

Table 6. Bird and mammals species classified as Species of Greatest Conservation Need in South Dakota with the potential to occur within the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

Species	Habitat	Likelihood of Occurrence
Birds		
American white pelican (*Pelecanus erythrorhynchos*)	Lakes with fish, island and peninsula cut-offs for nesting.	Probable.
Baird's sparrow (*Ammodramus bairdii*)	Extensive tracts of native mixed-grass prairie or lightly grazed pasture.	Probable
Bald eagle (*Haliaeetus leucocephalus*)	Large bodies of water, large mature trees, wide-ranging species.	Probable.

Table 6. Bird and mammals species classified as Species of Greatest Conservation Need in South Dakota with the potential to occur within the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

Species	Habitat	Likelihood of Occurrence
Buff-breasted sandpiper (*Calidris subruficollis*)	Short grasslands during migration.	Probable migrant.
Burrowing owl (*Athene cunicularia*)	Grasslands with small mammal burrows.	Possible, but not likely.
Ferruginous hawk (*Buteo regalis*)	Large tracts of native prairie.	Possible.
Golden eagle (*Aquila chrysaetos*)	Open prairie, forested areas, nest in high places including cliffs, trees, and human-made structures.	Possible.
Greater prairie-chicken (*Tympanuchus cupido*)	Tall-grass prairie, tall vegetation for nesting and brood rearing.	Possible, but not likely.
Lark bunting (*Calamospiza melanocorys*)	Sagebrush (*Artemisia* spp.) communities and mixed-grass prairies interspersed with shrubs, roadsides, and retired cropland.	Probable.
Le Conte's sparrow (*Ammodramus leconteii*)	Wetlands interspersed with tall grass, avoid woody vegetation.	Probable.
Marbled godwit (*Limosa fedoa*)	Forages in a variety of wetlands and nests in grazed native prairies.	Probable.
Northern Goshawk (*Accipiter gentilis*)	Forests.	Possible migrant.
Osprey (*Pandion haliaetus*)	Lakes and rivers with fish, tall structures for nesting.	Possible.
Peregrine falcon (*Falco peregrinus*)	Far-ranging species generally found along rivers or lakes or in any open habitat with adequate food.	Possible.
Piping plover (*Charadrius melodus*)	Barren sandbars in large river systems and on alkaline lakeshores.	Possible migrant.
Rufa red knot (*Calidris canutus rufa*)	Sandy beaches, mudflats, and exposed areas around wetlands and lakes.	Possible migrant.
Sprague’s pipit (*Anthus spragueii*)	Extensive tracts of native, ungrazed or lightly grazed mixed-grass prairie.	Possible migrant.
Whooping crane (*Grus americana*)	Shallow wetlands, various croplands, riverine habitat.	Possible migrant.
Willet (*Tringa semipalmata*)	Short grasslands, prairie, open water wetlands, often ephemeral.	Probable.
Wilson’s phalarope (*Phalaropus tricolor*)	Shallow wetlands and mudflats.	Probable.

Table 6. Bird and mammals species classified as Species of Greatest Conservation Need in South Dakota with the potential to occur within the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

Species	Habitat	Likelihood of Occurrence
Bats		
Northern long-eared bat (*Myotis septentrionalis*)	Forested areas, especially old growth and late successional forests where dead and dying trees provide roosting habitat.	Possible.
Silver-haired Bat (*Lasionycteris noctivagans*)	Forests, dead trees with loose bark, cavities in trees.	Probable.

Source: South Dakota Birds 2019, South Dakota Game, Fish, and Parks 2014a, 2014b, 2018, 2019c.

In summary, several bird and bat species of concern could possibly, or are likely to, use the Project, based on their range and distribution and the presence of suitable habitat with the Project. No Critical Habitat is currently located within the Project (USFWS 2017a).

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

There are several parcels of USFWS Dakota Tallgrass Prairie Wildlife Management Area in the northeastern portion of the Project (USGS 2018). There are also several Natural Resources Conservation Service Emergency Watershed Protection Floodplain Easement parcels in the northeastern portion (USGS 2018). While these areas may not be strictly precluded for development, they would likely be sensitive areas for development.

Several Waterfowl Production Areas, Wildlife Management Areas (Dakota Tallgrass Prairie Wildlife Management Area), State Conservation Areas, and State Recreation Areas are located within 10 mi (16 km) of the Project (USGS 2018). The USFWS Waubay National Wildlife Refuge is also within 10 mi. These protected areas provide nesting, foraging, and roosting habitat for a wide variety of wildlife species. The Bitter Lake Important Bird Area (IBA; National Audubon Society 2018), located about five mi (eight km) west of the Project, is the nearest IBA (Figure 6).

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

Grasslands/herbaceous land cover type accounted for about 26% of the Project (Table 1, Figure 2; Yang et al. 2018, MRLC 2019). About 16% of the Project is potentially native grassland (undisturbed grassland) and less than 1% undisturbed woodland (Bauman et al. 2016). As many bird species prefer or require native grasslands, the probability for the presence of species of concern exists (Tables 3, 4, 5 and 6). Areas of native grassland could contain habitat for Dakota skipper and/or Poweshiek skipperling. No other specific plant communities of concern were identified within the Project during the desktop analysis.

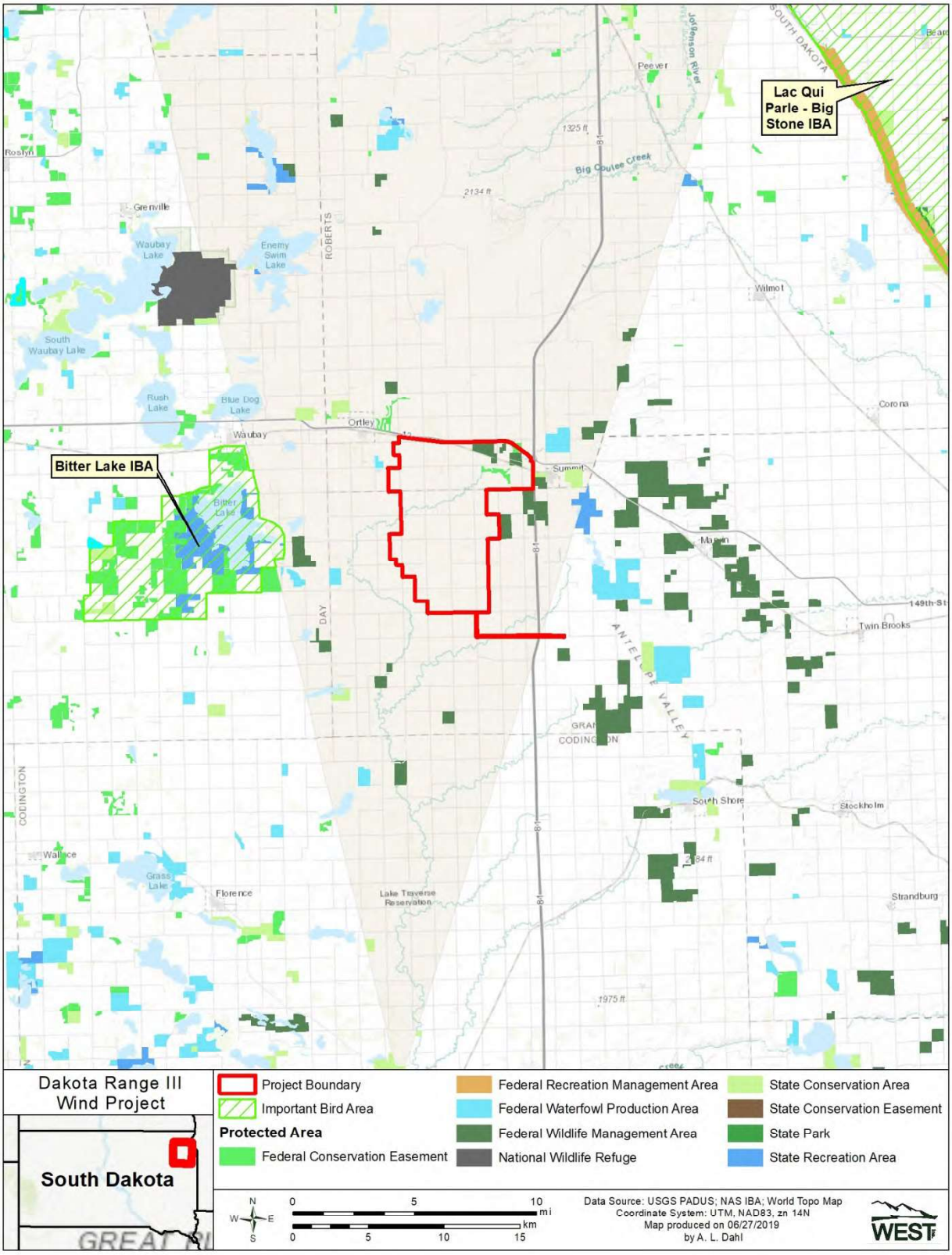

Figure 6. Important Bird Areas and protected areas within and near the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

4. Are there known critical areas of congregation of species of concern, including, but not limited to: maternity roosts, hibernacula, staging areas, winter ranges, nesting sites, migration stopovers or corridors, leks, or other areas of seasonal importance?

No known bat maternity roosts or hibernacula are present, or expected, within or near the Project. The Project has few treed areas (about 1%; Table 1) and no known caves, limiting the potential for bat roosting sites. However, potential roosting habitat for some bat species exists in the form of human-made structures.

The Project is found in the hills above the Prairie Coteau Escarpment (USGS 2003), about four mi (six km) from the top of the escarpment. Birds, particularly raptors, may fly along the top of the escarpment. No major bird staging areas are known to occur within the Project. There is also no evidence the Project serves as an important migration stopover, corridor, or winter range.

Grassland habitat (Table 1, Figure 2), including native grassland, exists within the Project for grassland-nesting birds, possibly including grasshopper sparrow (*Ammodramus savannarum*), lark bunting (*Calamospiza melanocorys*), bobolink (*Dolichonyx oryzivorus*), and chestnut-collared longspur (*Calcarius ornatus*). Sharp-tailed grouse (*Tympanuchus phasianellus*) and their leks could be found within the Project. SDGFP provided a sharp-tailed lek location 0.6 mi (1.0 km) outside the Project.

5. Using best available scientific information, has the developer or relevant federal, state, tribal, and/or local agency identified the potential presence of a population of a species of habitat fragmentation concern?

No official list of species of habitat fragmentation for South Dakota have been identified to date. Several bird species known to be affected by habitat fragmentation could potentially use the Project area: Baird's sparrow (*Ammodramus bairdii*), bobolink, chestnut-collared longspur, sharp-tailed grouse, Sprague's pipit (*Anthus spragueii*), and upland sandpiper (*Bartramia longicauda*). Because the Project is already fragmented, with almost 67% of the area converted to cultivated cropland, the concern would be not to fragment further the remaining native habitat.

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

The Project grassland and undisturbed grassland areas could provide suitable habitat for several species, such as Baird's sparrow, Sprague's pipit, grasshopper sparrow, bobolink, chestnut-collared longspur, and upland sandpiper. The following waterbird and shorebird species could potentially be found in the Project: American white pelican (*Pelecanus erythrorhynchos*), black tern (*Chlidonias niger*), marbled godwit (*Limosa fedoa*), willet (*Tringa semipalmata*), Wilson's phalarope (*Phalaropus tricolor*), and American bittern (*Botaurus lentiginosus*). Migrating and nesting raptors such as red-tailed hawks (*Buteo jamaicensis*), Swainson's hawks (*B. swainsoni*), northern harrier (*Circus hudsonius*), ferruginous hawk (*B. regalis*), and bald eagle are known to or may occur within the Project.

The Project may be used by several species of bats, particularly during the late summer and fall migratory periods. Bat species that may occur in the Project based on habitat requirements and distribution ranges include the eastern red (*Lasiurus borealis*), hoary (*L. cinereus*), and silver-haired (*Lasionycteris noctivagans*) bats (Table 7; BCI 2019), which are the species most commonly found as fatalities at wind energy facilities (Arnett et al. 2008, Arnett and Baerwald 2013, American Wind Wildlife Institute [AWWI] 2018, O'Connell and Piorkowski 2006, Kunz et al. 2007, Hale and Karsten 2010). Ponds and wetlands that may concentrate some bat species as they forage or drink are available in the Project and potential roosting habitat for some bat species exists within the Project in the form of scattered trees and farm buildings.

Table 7. Bat species, categorized by echolocation call frequency, with potential to occur within the Dakota Range III Wind Project, Grant and Roberts counties, South Dakota.

Common Name	Scientific Name
High-Frequency (>30 kHz)	
eastern red bat[1,2]	*Lasiurus borealis*
little brown bat[1]	*Myotis lucifugus*
northern long-eared bat[1,3]	*M. septentrionalis*
Low-Frequency (<30 kHz)	
big brown bat[1]	*Eptesicus fuscus*
silver-haired bat[1,2]	*Lasionycteris noctivagans*
hoary bat[1,2]	*Lasiurus cinereus*

Species information from South Dakota Bat Working Group 2004, South Dakota Natural Heritage Program (SDNHP) 2018, US Fish and Wildlife Service 2018b, International Union for Conservation of Nature 2019, Bat conservation International 2019.

1. Species known to have been killed at wind energy facilities (O'Connell and Piorkowski 2006, Kunz et al. 2007, Hale and Karsten 2010).

2. Long-distance migrant.

3. Federally-threatened species.

7. Is there a potential for significant adverse impacts to species of concern based on the answers to the questions above, and considering the design of the proposed project?

Based on the locations of turbines, including alternates, most are in cultivated croplands (91% of 45 turbines; MRLC 2019). Four of the turbines are located in grassland (9%; MRLC 2019), with one of those potentially located in undisturbed grasslands (Bauman et al. 2016). Development in grasslands, particularly undisturbed, native grassland, could impact several sensitive species. However, based on the overall paucity of undisturbed lands within the Project, it is unlikely development and operation of the wind facility could have significant adverse impacts on populations.

Four federally listed (USFWS 1967, 1985, 2013b, 2014) bird and bat species have potential to occur in Grant and Roberts counties (piping plover, rufa red knot, whooping crane, and northern long-eared bat). Again, while not a bird or bat, Dakota skipper and Poweshiek skipperling also have potential to occur in the counties. No listed species have been documented in the Project and potential habitat is limited. Therefore, the potential for significant adverse impacts to

individuals is low. There are four state-listed bird species with the potential to occur in the Project: piping plover, whooping crane, osprey, and peregrine falcon. All may occur within the Project, but as stated previously, probably not in large numbers. There are currently no state-protected bat species.

Bald and possibly golden eagles have the potential to occur based on distribution ranges and confirmed sightings (eBird 2019); nesting bald eagles could utilize the Project and surrounding areas. Diurnal raptor species, including species of concern, could utilize the Project during all seasons.

The Project may be used by several species of bats, particularly during migratory periods (Table 7). Some features may concentrate bat species as they forage or drink and there is potential roosting habitat for some bat species. It is difficult to assess the potential impact to bats based on the general lack of knowledge regarding bat use.

Similar to other wind energy projects in South Dakota, construction and operation of the Project could impact local and individual birds and bats, but it is unlikely the Project could have significant adverse impacts to species populations. The Project does not appear to be unique in the landscape and does not appear to be an area of special use by any one species. The Project has certain features, such as the native grassland, some trees (for nesting and roosting), and wetlands, that may attract birds and bats, but these features are not likely to attract these species more so than the surrounding areas. Project design, if it avoids native grassland areas, eagle nests, larger wetlands, and grouse leks, could minimize impact to local birds and bats.

5.2 Tier 3 – Baseline Avian and Bat Studies

Baseline small and large bird use surveys were conducted in 2017 and 2018. Raptor nest surveys, prairie grouse (*Tympanuchus* spp.) lek surveys, and bat acoustic surveys were conducted in 2018.

5.2.1 Avian Use Surveys

Avian use surveys were completed in 2017 – 2018 (Appendix A) at the proposed Dakota Range III Wind Project (Figure 1) located in Grant and Roberts counties, South Dakota. The objectives of the surveys were to: 1) provide estimates of eagle, large bird, and small bird use (eagles in accordance with the ECPG), and 2) evaluate species composition and seasonal and spatial use by birds, including sensitive species.

5.2.1.1 Methods

Avian use surveys were completed approximately monthly at 14 fixed-point survey locations (survey points) established throughout the Project from January 1 – May 29, 2017, and September 11, 2017 – August 26, 2018. Due to a number of boundary revisions, the number of survey points and number of times each survey point was surveyed varied (Appendix A). Of the 14 total fixed-point survey locations, five were surveyed during a 17-month period (18 visits; January 1 – May 29, 2017, and September 11, 2017 – August 26, 2018), two during a 14-month period (14 visits; April 11 – May 29, 2017, and September 11, 2017 – August 26, 2018), five during

a 12-month period (12 visits; September 11, 2017 – August 26, 2018), and two during an 11-month period (11 visits; October 27, 2017 – August 26, 2018).

Each survey point included an 800-m (2,625-ft) radius avian use survey plot (plot) centered on the survey point. Surveys were completed for 65 minutes (min), with small birds recorded within 100 m (328 ft) for the first five min; all raptors and large birds (including eagles) recorded out to 800 m for the next 20 min; and only eagles, federally or state-listed species, were recorded for the remaining 40 min of each 65-min survey. Observations of sensitive species were recorded throughout the surveys. Observations of sensitive species beyond the 800-m radius plot and in transit were recorded as incidental observations to document occurrence, but were excluded from statistical analyses.

At each survey point, the date, start and end time of the survey period, and weather information (e.g., temperature, wind speed and direction, and cloud cover) were recorded for each survey. Species or best possible identification, number of individuals, sex and age class (if possible), distance from plot center when first observed, closest distance, flight height or altitude above ground, activity (behavior), and habitat(s) were recorded for each observation. Approximate flight height and distance from plot center at first observation were recorded to the nearest 5.0-m (16.4-ft) interval. Flight paths of eagles were recorded on aerial maps and labeled by the unique observation number corresponding to the mapped individual.

Small birds detected within the 100-m radius plots and during the 5-min small bird surveys were used to calculate mean use (i.e., birds/100-m plot/5-min survey) and frequency of occurrence of small birds. Large bird observations detected within the 800-m radius plots and during the 20-min surveys were used to calculate mean use (i.e., birds/800-m plot/20-min survey) and frequency of occurrence of large birds

Seasonal mean use was calculated by first averaging the total number of birds seen within each plot during a visit, then averaging across plots within each visit, followed by averaging across visits within the season. Overall mean use was calculated as a weighted average of seasonal values by the number of days in each season.

The flight height recorded during the initial observation was used to calculate the percentage of birds flying within the rotor-swept heights (RSH; estimated to be between 25−200 m [82–656 ft] above ground level) and mean flight height during the large bird use surveys. The percentage of birds flying within the RSH at any time was calculated using the lowest and highest flight heights recorded. Auditory only observations were excluded from flight height calculations.

5.2.1.2 Results

Twenty-nine species (656 individual observations) were recorded during the small bird surveys (Appendix A). The most frequently recorded small bird species recorded were horned lark (*Eremophila alpestris*; 20.7%), snow bunting (*Plectrophenax nivalis*; 19.1%), chestnut-collared longspur (15.2%), and red-winged blackbird (*Agelaius phoeniceus*; 14.6%). Mean small bird use was slightly higher during fall (4.31 birds/100-m plot/5-min survey) compared to spring (3.79),

winter (3.37), and summer (2.52). Overall, small bird species richness was 0.79 bird species/100-m plot/5-min survey.

Twenty-nine unique species (1,772 observations) were recorded during large bird surveys (Appendix A). Waterfowl accounted for 88.0% of all large bird observations (1,560 observations), composed primarily of greater white-fronted geese (*Anser albifrons*; 650 observations) and snow geese (*Chen caerulescens*; 505 observations). Mean large bird use was higher during spring (29.84 birds/800-m plot/20-min survey) compared to fall (5.42), summer (2.00), and winter (0.09). Overall, large bird species richness was 0.50 bird species/800-m plot/20-min survey.

Five identified and one unidentified category called “other raptors” of diurnal raptor species (43 observations) were documented over the course of the 20-min large bird surveys (Appendix A). Diurnal raptor use was similar in summer (0.29 bird/800-m plot/20-min survey), fall (0.26), and spring (0.21), while winter raptor use was lower (0.06). Diurnal raptor use was primarily attributable to use of the area by red-tailed hawk (*Buteo jamaicensis*Use was relatively evenly distributed, with the highest use recorded at survey Point 76. Annual mean diurnal raptor use at the Project (0.20 raptor/800-m plot/20-minute survey; Appendix A)) was considered to be low based on a comparison with 48 other wind energy facilities that implemented similar protocols and had data for three or four seasons. One bald eagle observation was recorded within 800 m of survey locations during 199 hours of eagle use surveys. The one bald eagle observation was recorded on June 29, 2018.

No federal- or state-listed threatened or endangered species were recorded during the surveys. Four SGCN were observed during surveys: American white pelican (30 observations), bald eagle (one observation), chestnut-collared longspur (100 observations), and marbled godwit (one observation); the bald eagle was also observed incidentally (six observations).

5.2.2 Prairie Grouse Lek Survey

WEST completed a ground-based lek survey (Appendix B) at the proposed Dakota Range III Wind Project (not including the area of transmission line; Figure 1) in Roberts and Grant counties, South Dakota. The purpose of this survey was to locate and evaluate 2018 status of prairie-grouse (sharp-tailed grouse and greater prairie-chicken [*Tympanuchus cupido*]) leks in and near the area proposed for development.

5.2.2.1 Methods

Grassland habitats greater than 60 ac (24 ha) were considered to most likely support lekking grouse if present within the Project. Grassland tracts greater than 60 ac were digitized and composed the lek survey area within the Project. Ground-based surveys were completed three times during spring 2018 within the lek survey area: Round 1 was completed from March 29 – April 17, 2018, Round 2 from April 18 – April 28, 2018, and Round 3 from May 10 – May 12, 2018 (Appendix B). Historic lek locations were provided by SDGFP in August 2015 for the Project and vicinity, which included one sharp-tailed grouse lek approximately 0.75 mi (1.2 km) southwest of the Project. This lek location was also surveyed during each Round of surveys.

Surveys were completed from 30 min prior to sunrise until approximately two hours after sunrise. The field biologist drove public roads around and within each grassland area and stopped every half-mile (0.8 km; more often on hilly terrain) for 3−5 min to listen and look for displaying or calling grouse. If a lek was located, the biologist mapped the location on paper maps and recorded the number of males, females, and birds of unknown sex attending the lek. If visual confirmation could not be achieved, the biologist attempted to triangulate the auditory observation from two or more locations.

5.2.2.2 Results

Approximately 1,902.5 ac (769.9 ha) of grassland habitat greater than 60 acres were identified and surveyed for prairie grouse leks (Appendix B). No grouse leks were seen or grouse heard during any of the survey rounds. Thus, no prairie grouse leks were documented within the Project; the historic lek located southwest of the Project was inactive.

5.2.3 Raptor Nest Surveys

An aerial raptor nest survey was completed (Appendix C) at the proposed Project (includes all of current Project; Figure 1) in Roberts and Grant counties, South Dakota. The purpose of this survey was to locate bald eagle nests in or within 10 mi of the Project, and other large raptor nests in or within 1.0 mi (1.6 km) of the Project.

5.2.3.1 Methods

Aerial raptor nest surveys were completed from an R-44 helicopter between April 6 − 15, 2018. Surveys focused on locating large, stick nest structures in suitable raptor nesting substrate (e.g., trees, cliffs). The survey area included the proposed Project plus a 1-mi buffer for all raptor species and a 10-mi buffer for eagles. All suitable eagle and raptor nest habitat was surveyed by flying transects spaced approximately 0.5 mi (0.8 km apart at speeds of 60−75 mi per hour [mph; 97−121 km per hour {kph}]) throughout the survey area.

5.2.3.2 Results

No eagle nests were located within the Project area (Appendix C). Five occupied active eagle nests, one occupied inactive bald eagle nest, two unoccupied potential eagle nests, and one nest (Nest 8) occupied by a great horned owl (*Bubo virginianus*) that was previously occupied by bald eagles in 2017, were located within the survey area, all greater than 2.5 mi (4.0 km) from the Project boundary. Two eagle nests were located outside the survey area: Nest 4 was an occupied-active eagle nest located approximately 11.0 mi (17.7 km) southeast of the Project and Nest 7 was an unoccupied bald eagle nest located just over 10.0 mi west of the Project.

The nearest occupied bald eagle nests are approximately 2.9 mi (4.7 km) east and 4.9 mi (7.9 km) northeast of the Project (Appendix C). The nearest unoccupied bald eagle nest is approximately 4.8 mi (7.7 km) north. These nests are unlikely to be disturbed during construction or operation of the Project due to this distance. The majority of the eagle nests found in the 10-mi survey area were located along larger bodies of water or river, a habitat type which is not present within or immediately adjacent to the Project.

Four active raptor nests (two great horned owl and two red-tailed hawk) and seven inactive non-eagle raptor nests of undetermined species were located within the raptor nest 1.0 mi survey area (Appendix C). One of the active nests (great horned owl) and five of the inactive nests were within the Project.

The occupied non-eagle nests were occupied by red-tailed hawks and great horned owls, both common raptor species that breed in relatively high densities in South Dakota. Many of the unoccupied-inactive non-eagle raptor nests are likely red-tailed hawk nests from past years.

5.2.4 Bat Surveys

A bat acoustic survey (Appendix D) was conducted for the proposed Project (Figure 1) located in Grant and Roberts counties, South Dakota. The survey evaluated bat activity (bat passes per detector-night) at a meteorological (met) tower location and at bat features (locations with forest and water features where bats may be more likely to forage and roost) within the Project.

5.2.4.1 Methods

Four AnaBatTM SD2 and SD1 (Titley ScientificTM) bat call (pulses) detectors were used during the study. Two detectors were paired at a met tower, with one detector at ground level (ground-based station) approximately 5.0 ft (1.5 m) above the ground, and another within the potential rotor-swept zone for potential collision with a turbine blade (raised station), approximately 148.0 ft (45.1 m) above the ground. These two stations (met tower stations) were located in a flat, open grassland, and were considered representative of potential wind turbines locations. Two ground-based stations were also deployed at fixed locations near water and forest patch habitat features where bats are more likely to forage and roost (bat feature stations).

Acoustic monitoring began May 10, 2018, at the ground-based met tower station (DR2g). The raised met tower station (DR2r) was deployed June 16, 2018, and the two ground-based bat feature stations (DR4g and DR5g) were deployed on June 30, 2018. All stations monitored acoustic activity through October 22, 2018. The detectors were programmed to record from approximately 30 min before sunset until 30 min after sunrise each night throughout the survey period.

5.2.4.2 Results

AnaBats were operational for 480 detector nights (91.4% of the study period; Appendix D). The met tower stations recorded 648 bat passes over 264 nights for a mean (± Standard Error [SE]) of 2.34 ± 0.19 bat passes per detector-night. The bat feature stations recorded 3,357 bat passes over 216 nights for a mean (± SE) of 15.90 ± 1.39 bat passes per detector-night. During the 480 detector-nights the average bat activity rate (± SE) was lower at the met tower stations and higher at the bat feature stations, with 2.34 ± 0.19 bat passes per detector-night at the met tower station and 15.90 ± 1.39 bat passes per detector-night at the bat feature stations.

At the met tower stations, 13.0% of bat passes were classified as HF (e.g., little brown bat, eastern red bat), and 87.0% of bat passes were classified as LF (e.g., big brown bat, hoary bat, silver-

haired bat; Appendix D). At the bat feature stations, 41.8 % of bat passes were classified as HF and 58.2 % were classified as LF.

The average bat activity rate at the ground-based station at the met tower (3.26 ± 0.29 bat passes per detector-night) was more than the activity rate at the raised station (1.43 ± 0.19) throughout the study period (Appendix D).

Overall bat activity peaked in early August at the met tower stations, while activity at the bat feature stations peaked in late August and early September (Appendix D). At the bat feature stations, the LF bat activity peaked in late June and early July and HF bat activity peaked in early September at the bat feature stations. Average bat activity increased throughout the study period, peaking in early July; however, no large increases in overall bat activity were observed during the fall migration period when mortality risk at operating wind projects has historically been greatest.

6.0 ASSESSMENT OF RISKS TO BIRDS AND BATS

Impacts to species from wind energy development may include collisions during construction and operation, as well as other impacts such as disturbance/displacement of individuals from converted habitats and areas near project infrastructure. The risk of collision with human-made structures may differ by species (Arnold and Zink 2011).

Data from site-specific and regional pre-construction avian and bat surveys, as well as publicly available information from other wind energy projects, were used to provide an assessment of risk to birds and bats at the Project.

As this is a Bird and Bat Conservation Strategy the below sections focus on birds and bats; however, the Project also avoided potential risk to Dakota skipper and Poweshiek skipperling by evaluating habitat and conducting field surveys of potential habitat areas. One area was found to contain suitable reproductive habitat and this area is being avoided by all construction activities. A second area was found to contain margin habitat for foraging or dispersal, not reproductive habitat, and will be avoided between late June and late July to avoid impacts to the species when in flight stage if they are dispersing through the area. Impacts to these species is not anticipated.

6.1 Mortality Risk

6.1.1 Birds

Collision with various human-made structures can be a significant source of bird mortality (Erickson et al. 2014, AWWI 2018, 2019), but may have no discernable effect on bird populations (Arnold and Zink 2011). Project construction can result in the direct mortality of birds and other wildlife. Impacts from construction activities could include the destruction of nests, eggs, or young, as well as collisions with vehicles and construction equipment, similar to other types of construction projects.

The majority of turbine-related fatalities in the US and Canada are passerines (Erickson et al. 2014, AWWI 2019). Although avian collision mortality can occur during both the breeding and migration seasons, patterns in avian mortality at tall towers, buildings, wind turbines, and other human-made structures suggest the majority of mortalities occur during the spring and fall migration periods (Strickland et al. 2011, Erickson et al. 2014, AWWI 2019). During avian use surveys, mean use by small birds was highest in the fall (4.31 number of bird observations/100-m plot/5-min survey), followed by spring (3.79), winter (3.37), and summer (2.52; Appendix A). The results of this study suggest risk of collisions with wind turbines for small birds would most likely be greatest in the spring and fall, as mean use was highest in those seasons, and similar to other studies. Given the presence of small birds throughout the Project and likely occurrence of a "broad front" migration given lack of defined ridges or large waterbodies, risk of collisions with wind turbines will likely be uniform throughout most of the Project area (Appendices A).

6.1.1.1 Diurnal Raptors

Diurnal raptors occur in most areas with the potential for wind energy development and account for about 8% of fatalities, which AWWI (2019) concluded was greater than expected based on raptor population size and may be detrimental to populations of some raptor species. Reasons for this could be raptors are more susceptible to collision or are more readily observed during fatality monitoring studies (AWWI 2018). However, the two most commonly found raptors, red-tailed hawk and American kestrel (*Falco sparverius*), are also the most abundant diurnal raptors in the US (AWWI 2018, 2019). Other studies have found a relationship between raptor abundance and number of fatalities (Strickland et al. 2011). AWWI (2019) reported a peak in fall fatalities of raptors and suggested the fatalities might be migrating raptors.

At the Project, diurnal raptor use was higher in summer (0.29 number of raptors/800-m plot/20-min survey), fall (0.26), and spring (0.21) and lower in winter (0.06; Appendix A). Annual mean diurnal raptor use at the Project was 0.20. Compared to results of publicly available data from 48 other wind facilities (spanning raptor use between 0.06−2.34) in the US, indicated raptor use within the Project was relatively low (Appendix A). Relatively few raptor nests were found within the Project (Appendix C). Together, this suggests the Project will likely pose some risk to diurnal raptors.

Twenty-five studies from wind energy facilities in South Dakota, North Dakota, and Minnesota have publicly available raptor mortality data. Among these, diurnal raptor fatalities ranged from zero fatalities per megawatt (MW) per year to 0.47 fatalities/MW/year (Figure 7). Based on the general proximity of these facilities to the Project, diurnal raptor fatalities at the Project will likely be within this range; however, other factors, such as comparisons of abundance or use in relation to other facilities, habitat, or species compositions, may help further inform potential risk.

In summary, the overall risk to raptors appears to be relatively low, based on relatively low use of the Project by raptors, the majority of their flight being recorded below the RSH, relatively few nests within the Project, and the predicted low fatality rate (Appendices A and C).

6.1.1.2 Eagles

Potential impacts to bald and golden eagles are of particular concern for wind projects in the US. In a study of a large fatality database, 37 golden eagle (20 of these fatalities were found incidentally; AWWI 2019). Pagel et al. (2013) reported six bald eagle fatalities, and according to the USFWS's recent survey (2013 – 2018), 49 bald eagle verifiable take records (only those records with supporting information) have been documented (USFWS 2018c).

Seven bald eagles were observed during avian surveys or incidentally during avian use surveys (Appendix A). Five occupied active eagle nests, one occupied inactive bald eagle nest, two unoccupied potential eagle nests, and one nest occupied by an owl previously occupied by bald eagles in 2017, were located within 10 mi, all greater than 2.5 mi from the Project boundary (Appendix C). Although levels of bald eagle use were relatively low within the Project, there is the potential for collision risk to bald eagles.

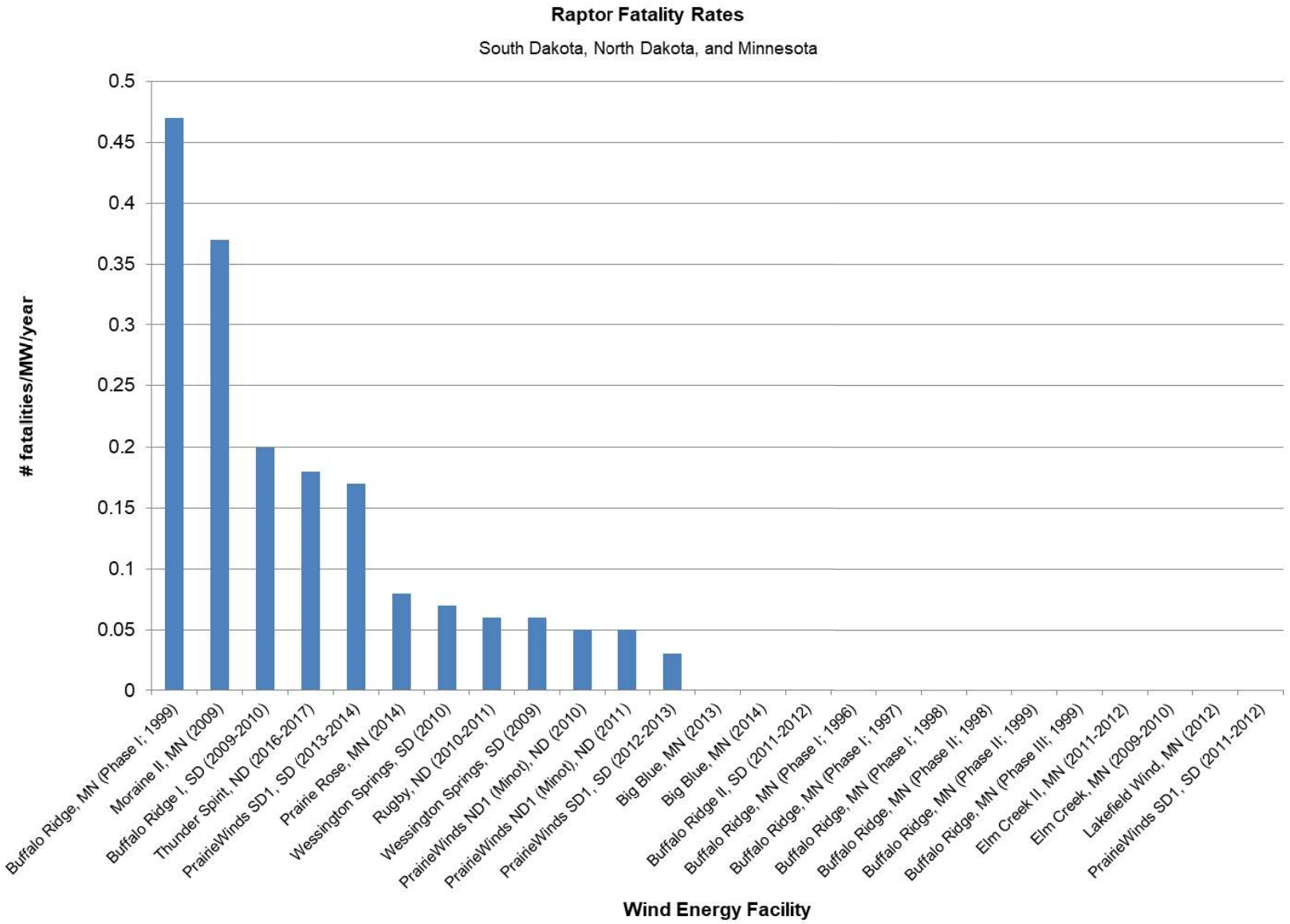

Figure 7. Fatality rates for diurnal raptors (number of raptors per megawatt [MW] per year) from publicly available studies at wind energy facilities in South Dakota, North Dakota, and Minnesota.

Figure 7 (*continued*). Fatality rates for diurnal raptors (number of raptors per megawatt per year) from publicly available studies at wind energy facilities in South Dakota, North Dakota, and Minnesota. Data from the following sources:

Wind Energy Facility	Fatality Reference
Buffalo Ridge, MN (Phase I; 1999)	Johnson et al. 2000
Moraine II, MN (2009)	Derby et al. 2010d
Buffalo Ridge I, SD (2009-2010)	Derby et al. 2010b
Thunder Spirit, ND (2016-2017)	Derby et al. 2018
PrairieWinds SD1, SD (2013-2014)	Derby et al. 2014
Prairie Rose, MN (2014)	Chodachek et al. 2015
Wessington Springs, SD (2010)	Derby et al. 2011a
Rugby, ND (2010-2011)	Derby et al. 2011b
Wessington Springs, SD (2009)	Derby et al. 2010a
PrairieWinds ND1 (Minot), ND (2010)	Derby et al. 2011c
PrairieWinds ND1 (Minot), ND (2011)	Derby et al. 2012e
PrairieWinds SD1, SD (2012-2013)	Derby et al. 2013
Big Blue, MN (2013)	Fagen Engineering 2014
Big Blue, MN (2014)	Fagen Engineering 2015
Buffalo Ridge II, SD (2011-2012)	Derby et al. 2012a
Buffalo Ridge, MN (Phase I; 1996)	Johnson et al. 2000
Buffalo Ridge, MN (Phase I; 1997)	Johnson et al. 2000
Buffalo Ridge, MN (Phase I; 1998)	Johnson et al. 2000
Buffalo Ridge, MN (Phase II; 1998)	Johnson et al. 2000
Buffalo Ridge, MN (Phase II; 1999)	Johnson et al. 2000
Buffalo Ridge, MN (Phase III; 1999)	Johnson et al. 2000
Elm Creek II, MN (2011-2012)	Derby et al. 2012b
Elm Creek, MN (2009-2010)	Derby et al. 2010c
Lakefield Wind, MN (2012)	Minnesota Public Utilities Commission 2012
Prairie Winds SD1, SD (2011-2012)	Derby et al. 2012c

6.1.2 Bats

Bat fatalities have been discovered at most wind energy facilities monitored in North America, with mortality rates ranging from 0.10 (Tierney 2007) to 39.70 bats/MW/year (Fiedler et al. 2007). Bat mortality at wind facilities is due to collisions with moving turbine blades (Grodsky et al. 2011, Rollins et al. 2012), but the underlying reasons for why bats come near turbines are still largely unknown (Cryan and Barclay 2009). While it is generally expected pre-construction bat activity is positively correlated to post-construction bat mortalities (Kunz et al. 2007), to date, this relationship has not been found to be significantly correlated (Solick and Howlin 2018, Hein et al. 2013). Therefore, the current approach to assessing the risk to bats requires a qualitative analysis of activity levels, spatial and temporal relationships, species composition, and comparison to regional fatality patterns (AWWI 2018).

Overall, bat activity rates at the Project were low to moderate, with the majority of bat passes consisting of LF bats (Appendix D). Three migratory tree-roosting bats (hoary bats, eastern red bats, and silver-haired bats) are the most commonly found bat fatalities at many facilities in North American (Arnett and Baerwald 2013, AWWI 2018, 2019; Thompson et al. 2017). Therefore, it could be these species would likely be the most common fatalities at the Project.

Most bat fatality studies at wind energy facilities in the US have shown a peak in fatalities in late summer and early fall, which is the migration time of migratory tree bats (AWWI 2018). A spring migration peak is less evident (Arnett et al. 2008, AWWI 2019). Additionally, studies found generally lower mortality earlier in the summer and very low mortality during the spring (Johnson 2005, Arnett et al. 2008). At the Project, peak activity occurred mainly in August (Appendix D). These results suggest bat fatalities at the Project may be highest during the late summer to early fall, and consist largely of migrating individuals.

Among facilities with publicly available data in South Dakota, North Dakota, and Minnesota, bat fatalities have ranged between 0.16−19.87 fatalities/MW/year (Figure 8). Some studies indicated facilities in agricultural settings in the Midwest produced higher levels of bat fatalities (Jain 2005, Baerwald 2008, Gruver et al. 2009); therefore, fatalities at the Project may be similar to those found at other wind energy facilities in the Midwest. Overall, it is expected bat risk at the Project will be similar to other local and regional projects. For example, the Buffalo Ridge II Wind Project (Derby et al. 2012a), located approximately 58 mi (93 km) southeast from the Project, has similar land cover, with rolling topography dominated by grassland and herbaceous vegetation with some open water available (Figures 2 and 3); in 2012, the bat fatality estimate was 2.81 (Appendix D). In summary, it is expected bat mortality at the Project would be low to moderate and follow similar patterns as those observed at other facilities in the Midwest.

6.2 Displacement

6.2.1 Birds

In addition to removing available habitat, the presence of wind turbines may displace wildlife from an area due to the creation of edge habitat, the introduction of vertical structures, and disturbances directly associated with turbine operation (USFWS 2012, AWWI 2018). Impacts are concentrated near turbine locations (Fernandez-Bellon et al. 2018) and along access roads, although available data indicate avoidance of wind turbines by birds may extend up to 245−2,625 ft (75−800 m) from a turbine, depending on the environment and the bird species affected (Strickland 2004). The AWWI (2019) concluded indirect impacts on birds from operating wind turbines due to displacement have been documented in a subset of the species studied, but these impacts have not been found consistently across studies.

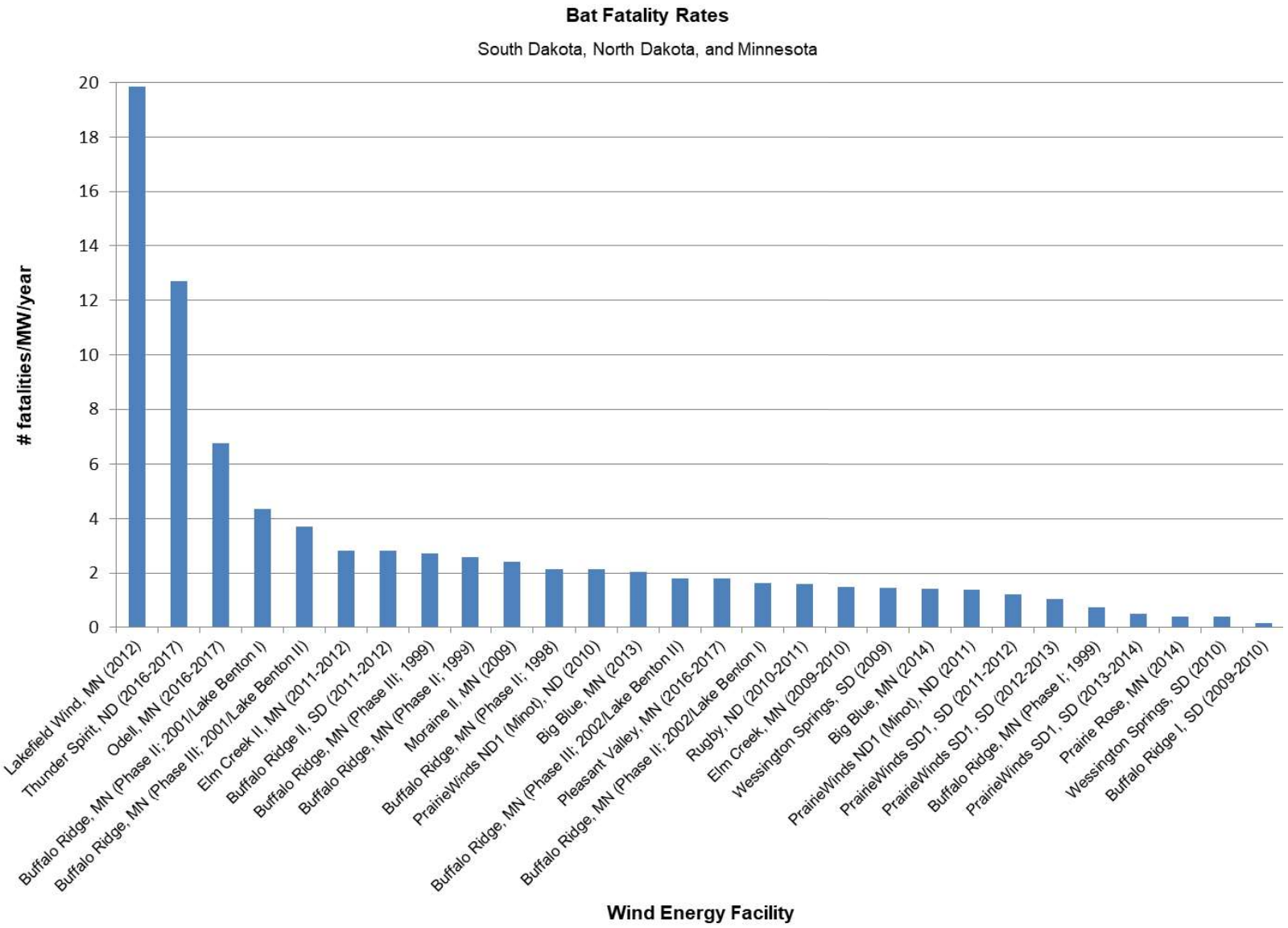

Figure 8. Fatality rates for bats (number of bats per megawatt [MW] per year) from publicly available studies at wind energy facilities in South Dakota, North Dakota, and Minnesota.

Figure 8 (*continued*). Fatality rates for bats (number of bats per megawatt per year) from publicly available studies at wind energy facilities in South Dakota, North Dakota, and Minnesota. Data from the following sources:

Wind Energy Facility	Fatality Reference
Lakefield Wind, MN (2012)	Minnesota Public Utilities Commission 2012
Thunder Spirit, ND (2016-2017)	Derby et al. 2018
Odell, MN (2016-2017)	Chodachek and Gustafson 2018
Buffalo Ridge, MN (Phase II; 2001/Lake Benton I)	Johnson et al. 2004
Buffalo Ridge, MN (Phase III; 2001/Lake Benton II)	Johnson et al. 2004
Elm Creek II, MN (2011-2012)	Derby et al. 2012b
Buffalo Ridge II, SD (2011-2012)	Derby et al. 2012a
Buffalo Ridge, MN (Phase III; 1999)	Johnson et al. 2000
Buffalo Ridge, MN (Phase II; 1999)	Johnson et al. 2000
Moraine II, MN (2009)	Derby et al. 2010d
Buffalo Ridge, MN (Phase II; 1998)	Johnson et al. 2000
PrairieWinds ND1 (Minot), ND (2010)	Derby et al. 2011c
Big Blue, MN (2013)	Fagen Engineering 2014
Buffalo Ridge, MN (Phase III; 2002/Lake Benton II)	Johnson et al. 2004
Pleasant Valley, MN (2016-2017)	Tetra Tech 2017
Buffalo Ridge, MN (Phase II; 2002/Lake Benton I)	Johnson et al. 2004
Rugby, ND (2010-2011)	Derby et al. 2011b
Elm Creek, MN (2009-2010)	Derby et al. 2010c
Wessington Springs, SD (2009)	Derby et al. 2010a
Big Blue, MN (2014)	Fagen Engineering 2015
PrairieWinds ND1 (Minot), ND (2011)	Derby et al. 2012e
PrairieWinds SD1, SD (2011-2012)	Derby et al. 2012c
PrairieWinds SD1, SD (2012-2013)	Derby et al. 2013
Buffalo Ridge, MN (Phase I; 1999)	Johnson et al. 2000
PrairieWinds SD1, SD (2013-2014)	Derby et al. 2014
Prairie Rose, MN (2014)	Chodachek et al. 2015
Wessington Springs, SD (2010)	Derby et al. 2011a
Buffalo Ridge I, SD (2009-2010)	Derby et al. 2010b

6.2.1.1 Waterfowl

Indirect impacts due to displacement from wind turbines have also been studied in waterfowl. Loesch et al. (2013) studied changes in densities of five species of breeding waterfowl at two wind facilities in the Missouri Coteau of North Dakota and South Dakota. Impacts to breeding ducks were evident in about 50% of the site-year combinations; actual decreases in density were limited to 10-21% breeding pairs (Loesch et al. 2013).

The magnitude of these impacts to birds is expected to be minimal, as the Project is sited in a previously disturbed landscape and will result in a relatively small amount of habitat loss and disruption relative to the surrounding landscape. Impacts are expected to consist primarily of shifts in species distribution within the Project that are similar to existing conditions resulting from anthropogenic effects (USFWS 2012).

6.2.1.2 Passerines

Wind energy facility construction appears to cause small-scale local displacement of grassland passerines. Construction also reduces habitat effectiveness because of the presence of access roads and large gravel pads surrounding turbines (Leddy 1996, Johnson et al. 2000). Research

has indicated that indirect impacts of wind turbines on grassland-nesting birds due to displacement vary across years, species, sites, and distance from turbines (Erickson et al. 2004, Hale et al. 2014, G. Johnson et al. 2000, D. Johnson et al. 2016, Leddy et al. 1999, Shaffer and Buhl 2016, Shaffer and Johnson 2009, Stevens et al. 2013). The USFWS Draft Midwest Wind Energy Multi-Species Habitat Conservation Plan (April 2016) concluded wind facilities may displace some species of grassland birds locally (USFWS 2016).

Leddy et al. (1999) surveyed bird densities in Conservation Reserve Program grasslands at the Buffalo Ridge wind energy facility in Minnesota, and found mean densities of 10 grassland bird species were four times higher at areas located 591 ft (180 m) from turbines than they were at grasslands nearer turbines. Similarly, Shaffer and Buhl (2016) demonstrated reduced breeding density by seven of nine breeding grassland birds and the attraction of one species (killdeer [*Charadrius vociferus*]) likely attributed to increased nesting habitat from road and pad construction. Johnson et al. (2000) found reduced use of habitat by seven of 22 grassland-breeding birds following construction of the Buffalo Ridge wind energy facility.

The majority (68%) of the Project consists of cultivated croplands (Figure 2, Table 1), which have limited value to nesting passerines and other bird species; however grassland-nesting birds could utilize grasslands, some of it probably native, and pasture (26%) within the Project. Overall displacement impacts resulting from Project development are anticipated to be low, based on the limited amount of grasslands and pasture in the current Project and limited impacts within grassland areas.

6.2.1.3 Raptors

Raptors nesting closer to turbines have the potential to be impacted by disturbance due to construction or operation of the facility. Raptors displaced from wind energy facilities might move to lower quality habitat with fewer disturbances, with an overall effect of reducing breeding success. Most studies of raptor displacement from wind energy facilities, however, indicated effects to be negligible with some exceptions (Howell and Noone 1992, Johnson et al. 2000, 2002; Madders and Whitfield 2006). Limited displacement of nesting raptors is anticipated for the Project given the low density of raptor nests documented within the Project and surrounding area (Appendix C) and the relatively low raptor use (0.20 number of raptors/800-m plot/20-min survey) of the Project (Appendix A).

6.2.1.4 Eagles

Like many animals, bald eagles are known to change their behavior in response to human activity (Steidl and Anthony 2000, Grubb and King 1991, Fraser et al. 1996), although sometimes the response is negligible (Mathisen 1968, Fraser et al. 1985) or varied (Steidl and Anthony 2000, Buehler 2000). As with other raptors, eagles may react negatively by avoiding areas with human disturbance (Grubb and King 1991, Fraser et al. 1996) which could cause them to experience difficulty nesting, foraging, and roosting (Steidl and Anthony 2000). Golden eagles appeared to change their flight to avoid wind turbines in British Columbia, Canada (Johnston et al. 2014). In some cases, bald eagles have become habituated to human activity (Steidl and Anthony 2000).

The Project does not appear to provide unique or more habitat for eagles compared to the surrounding landscape (Figure 2). Therefore, a displaced eagle may be able to find suitable habitat with little effort. Impacts to eagles are estimated to be low based on relatively low eagle use and the lack of nesting eagles in the Project (Appendices A and C).

6.2.2 Bats

Limited information is available regarding the disturbance or displacement of bats at wind energy facilities. Bats in the Project may be temporarily disturbed by human activities. Habitat for bats within the Project is limited to a few wooded areas, individual trees, and wetlands (Figures 2 and 3, Appendix D). Outbuildings and other anthropogenic structures may be used as roosting habitat by some species, and cultivated crops may provide foraging habitat for bat species adapted to use such habitat. Due to the lack of any known maternity roosts near the Project, as well as the relatively limited amount of wetland habitat for foraging, displacement impacts to bats at the Project are expected to be minimal.

6.3 Potential Risk to State and Federal Endangered and Threatened Species

The potential, which varies by species, exists for some federally and state-listed species to occur within the Project (Tables 3 and 4). No endangered or threatened species were identified during site-specific surveys (Appendices A, B, C, and D). B.

6.3.1 Osprey

No ospreys (state-listed as threatened and SGCN) were detected in the Project area during avian surveys or incidentally (Appendix A). Roberts County is considered part of the osprey's primary summer range (SDGFP 2014b), so it is possible birds could be found in the area. However, the osprey's primary habitat, lakes and rivers, is generally lacking within the Project (Figure 3). Additionally, no osprey nests were observed during raptor nest surveys, which occurred in an area within 10 mi of the Project (Appendix C). Due to the lack of detections of individuals or nests, and primary habitats, impacts to the species are not anticipated.

6.3.2 Peregrine Falcon

No peregrine falcons (state-listed as endangered, BCC, and SGCN) were detected in the Project area during avian surveys or raptor nest surveys (Appendix A). It is possible falcons could utilize the Project during migration, but as it was not observed during avian use surveys (Appendix C) and impacts to the species are not anticipated.

6.3.3 Piping Plover

No piping plovers (state- and federally listed as threatened, SGCN) were detected in the Project area during avian surveys or incidentally (Appendix A). Due to the lack of detections and the Project's location outside of the species commonly used breeding locations in South Dakota, no impacts to the species are anticipated.

6.3.4 Rufa Red Knot

No rufa red knots (federally listed as threatened, SGCN) were detected in the Project during avian surveys or incidentally (Appendix A); however, the species may potentially migrate over the Project (USFWS 2013c). Limited stopover habitat for the species exists within the Project (Figures 2 and 3). Due to the lack of observations and the limited suitable stopover habitat, impacts to rufa red knot are not anticipated.

6.3.5 Whooping Crane

No whooping cranes (state- and federally listed as endangered, SGCN) were detected in the Project during avian surveys or incidentally (Appendix A) and the Project occurs significantly east of the main migration corridor. However, potentially suitable whooping crane stopover habitat does occur in the Project and surrounding landscape (Section 5.1.1), and the species has been rarely documented in the region (CWCTP 2018). Cranes do not appear to be overly susceptible to collision with turbines (Derby et al. 2012d). While no impacts whooping cranes are anticipated due to the Project's location outside of the main migration corridor, lack of concentrated whooping crane stopover habitat, and low predicted use of the landscape by cranes; diligence and reporting of cranes within proximity of the Project by site personnel and subsequent curtailment of turbines within 2 miles of whooping cranes would further reduce any minimal risk.

6.3.6 Northern Long-eared Bat

The northern long-eared bat's (federally listed as threatened, SGCN) current range includes the Project (USFWS 2018b).However, the Project is not located near any large, known bat colonies, water sources, caves, rocky outcrops, or other features likely to attract large numbers of bats (Appendix D). In addition, the Project does not contain topographic features that may funnel migrating bats. Roosting habitat within the Project is limited to a few wooded areas (Appendix D), trees near farmsteads, and various barns and outbuildings. Overall, the Project provides limited roosting opportunities for bats. No impacts to northern long-eared bats are anticipated.

7.0 AVOIDANCE AND MINIMIZATION MEASURES

Information gathered during Tier 1, 2, and 3 studies were used during the Project design and turbine and infrastructure siting process to reduce potential impacts to birds and bats and their habitats. The following Conservation Measures will be implemented during the design, construction, and operational phases of the Project. These Conservation Measures represent Dakota Range III's willingness to ensure the least harm to avian and bat species.

7.1 Conservation Measures Implemented Project Design and Siting

Dakota Range III designed the Project to locate wind turbines, met towers, and other appurtenances such that bird and bat collisions are minimized. Project design and siting measures to avoid or minimize risk to avian and bat species included the following:

- Used the existing road network to reduce the need for road construction.

- Coordinated with the Federal Aviation Administration to minimize the number of wind turbines and met towers that require lighting.
- Will keep lighting at substations and other operations and maintenance facilities at a minimum required for safety and security needs (i.e., directional, hooded and/or shielded, low-intensity, low-sodium lights equipped with motion sensors). Extinguish all internal turbine nacelle and tower lighting when unoccupied.
- To the extent commercially reasonable, maximized power generation per turbine in order to reduce the number of turbines needed to achieve maximum energy production.
- Avoided all construction within potential reproductive habitat for Dakota skipper and/or Poweshiek skipperling (identified as Grassland Parcel 55; Figure 9).
- Avoided construction within foraging or dispersal habitat for Dakota skipper and/or Poweshiek skipperling from late June through late July (identified as Grassland Parcel 75; Figure 9).

7.2 Conservation Measures to be Implemented During Construction

Construction of the Project is expected to begin in 2019 and occur over a period of approximately 12 months, which will be the heaviest use of the site during the life of the Project. The following conservation measures will be implemented to avoid or minimize risk to avian and bat species during construction:

- Tree clearing, when feasible, will be conducted during the non-active bat season (November 1 – March 15) when bats are hibernating or otherwise not present in Project. To avoid potential take of northern long-eared bats no tree clearing will be done without explicit emergence surveys of trees to be removed between June 1 and July 31.
- Vehicle speeds on private access roads will be limited to 25 mph to avoid wildlife collisions. Construction vehicles will be restricted to pre-designated access routes. Following Project construction, roads not needed for site operations will be restored to native vegetation or as agreed upon by landowner.
- To the extent feasible, the area required for Project construction and operation will be minimized. As part of the Stormwater Pollution Prevention Plan (SWPP), Dakota Range III will develop a restoration plan for restoring all areas of temporary disturbance to their previous condition, including the use of native species when seeding or planting during restoration. The restoration plan will ensure:
    - All areas disturbed temporarily by Project construction will be restored including temporary disturbance areas around structure construction sites, laydown/staging areas, and temporary access roads.
    - Topsoil salvage will be included in all grading activities to the extent feasible.
    - The inclusion of performance criteria, habitat replacement specifications, and tentative timeframes for restoration of the site, in addition to provisions for a monitoring program to assess the success of the restoration efforts.

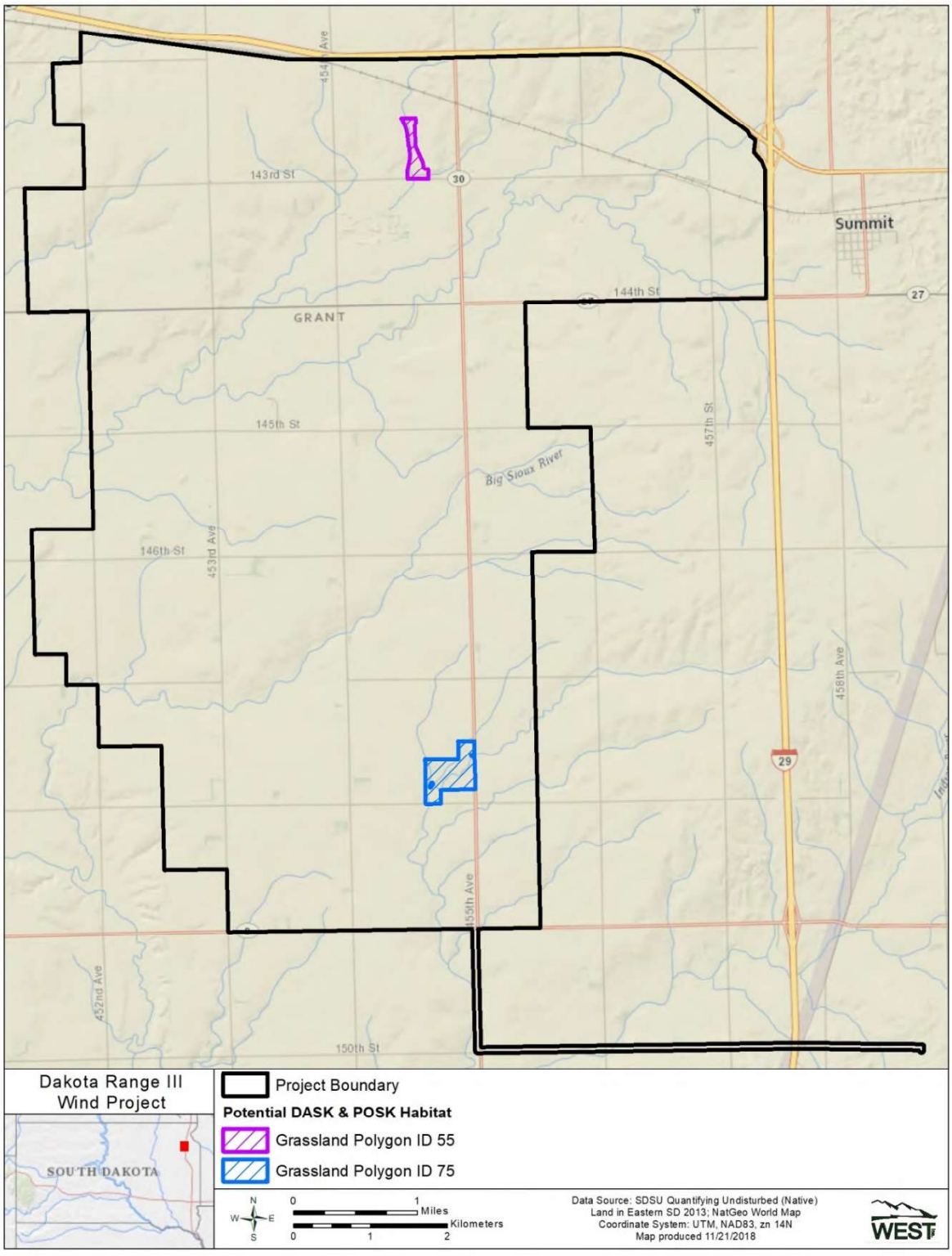

Figure 9. Potential reproductive habitat (Grassland Polygon ID 55) and potential foraging or dispersal habitat (Grassland Polygon ID 75) for Dakota skipper and/or Poweshiek skipperling within the Dakota Range III Wind Project in Grant and Roberts counties, South Dakota.

- Appropriate natural fiber erosion control methods will be used during construction to eliminate or minimize runoff in highly sensitive areas and avoid impacts to hydrology.
- Dakota Range III will provide training resources to all construction and site personnel on identification of sensitive species and their habitats to minimize and/or avoid disturbance.
- Gravel will be placed at least 5 ft around each turbine foundation to discourage small mammals and reptiles from burrowing under or near turbine bases.
- Sensitive resources (e.g., nests) identified during pre-construction activities will be flagged and all site personnel notified of their presence and necessary setbacks.
- No unleashed dogs will be allowed on the Project during construction.
- All trash will be covered in containers and work sites will be cleared daily of any garbage and debris related to food.
- All permanent met towers will be un-guyed.
- All power lines will be constructed in accordance with the most current Avian Power Lines Interaction Committee Guidelines to protect birds from electrocution and collision.

7.3 Conservation Measures to be Implemented During Operations

- Low speed limits (e.g., less than 25 mph) will be enforced on all private access roads within the facility.
- Other than maintenance vehicles, which will park at the entrance of turbines for maintenance purposes, parts and equipment that may be used as cover for prey will not be stored at the base of wind turbines while a turbine is operational and spinning.
- Fire hazards from vehicles and human activities will be reduced (e.g., use of spark arrestors on power equipment, avoiding driving vehicles off roads, allowing smoking in designated areas only).
- Dakota Range III will develop and implement a noxious weed control plan in accordance with the land lease agreements.
- Pest and weed control measures will be implemented as specified by county, state, and federal requirements.
- A 2-year avian and bat fatality monitoring program will be implemented after the project is operational and restoration activities have been completed.
- A livestock and non-regulated wildlife carcass removal program will be implemented to minimize potential attractants for carrion-feeding raptors.
- All of Dakota Range III's employees and contractors working on site will receive worker awareness training for identifying and responding to encounters with sensitive biological resources, including avian and bat species. The training:
    - Will be conducted by Dakota Range III or their designee.

- Will include instructions for all employees, contractors, and site visitors to avoid harassing or disturbing wildlife.
- Will include instruction on identification and values of plant and wildlife species and significant natural plant community habitats, the issue of micro-trash and its effects, fire protection measures and measures to minimize the spread of weeds during construction, and hazardous material spill and containment measures.
- Information will be provided to all workers on the Project detailing information on potential state and federal special-status animal and plant species, including whooping crane identification, which might be discovered on the Project site.
- Will include an overview of the distribution, general behavior, and ecology of golden and bald eagles. Employees will be informed they are not authorized to approach, handle, or otherwise move any eagles that might be encountered during construction, whether alive, injured, or deceased. Operations personnel will be instructed to report any finding of an injured or deceased eagle to USFWS within 24 hours of positive identification by a qualified biologist.

8.0 POST-CONSTRUCTION MONITORING: TIER 4

8.1 Tier 4a – Avian and Bat Fatality Monitoring

The primary objective of fatality monitoring is to estimate avian and bat mortality at the Project and to determine whether the estimated mortality is lower, similar to, or higher than the average mortality observed at other regional projects, and consistent with the low levels of mortality predicted during the pre-construction risk assessments (see Section 6.0).

8.1.1 Baseline Monitoring

Baseline monitoring consists of short-term intensive surveys involving standardized carcass searches, bias trials for searcher efficiency, and carcass removal trials conducted by trained biologists. Baseline fatality monitoring will be conducted during the first year of commercial operations of the Project. The monitoring study design will be consistent with the recommendations for operations monitoring included in the WEG. Additionally, the scope and duration of the fatality monitoring study will be developed to be consistent with monitoring programs that have been conducted at wind projects in the Midwest, or otherwise recommended by USFWS Region 6 Office.

8.1.1.1 Monitoring Activities

Baseline fatality monitoring will be conducted during spring, summer, and fall seasons given difficulties in conducting surveys during winter conditions in the upper Midwest. Baseline avian and bat monitoring will consist of the following components:

1) Standardized carcass searches of selected turbines in a rectangular plot centered on the turbine.
2) Searcher efficiency trials to estimate the percentage of carcasses found by searchers.

3) Carcass persistence trials to estimate the length of time a carcass remains in the field for possible detection.
4) Data analysis and calculation of fatality rates.

8.1.1.2 Reporting

A report will be completed following completion of the two-year fatality monitoring program and will be submitted to the USFWS and the SDGFP within three months of completion of surveys. The report will detail the results of mortality surveys, as well as the results of searcher efficiency and carcass removal trials. Fatality rates will be estimated following the most recent and acceptable methods. The report will also include a validation of risk assessment, comparing the results of pre-construction avian and bat use data with the actual impacts as determined by the post-construction fatality monitoring.

8.1.2 Long Term Monitoring

All injured raptors, waterfowl, waterbirds, federally or state-listed bird species, and federally listed bats will be promptly delivered to the appropriate rehabilitation center or other approved facility as specified in state and federal permits; or as directed by necessary law enforcement personnel. All injured non-protected bird and bat species may be humanely euthanized on-site with appropriate approvals and training.

Carcasses of federally listed species or eagle carcasses, if discovered, will be flagged, covered, and left in place. The USFWS will be notified within 24 hours of discovery, and any handling of the carcass will be at the USFWS direction/authorization. For non-federally listed and non-eagle carcasses, Dakota Range III may either leave in place or properly collect and dispose of carcasses, depending on the current practice at the Project, as determined by Dakota Range III legal. Should “leave in place” be the current practice at the Project, the personnel making the discovery will complete the Wildlife Incident Report form and file the form in facility files. Should it be Project practice to collect and dispose of non-listed and non-eagle carcass discoveries, the appropriate wildlife salvage and collection permits will be obtained from the state and USFWS prior to any collection of carcasses. Upon completing the Wildlife Incident Report, the personnel will collect and dispose of the carcass in accordance with the applicable permit(s) and complete any reporting required by the applicable permit(s).

8.2 Tier 4b – Assessing Impacts to Habitat

No Tier 4b studies to assess impacts to habitat or species of special concern are deemed necessary at this time, based on Tier 3 findings.

9.0 RESEARCH: TIER 5

In addition to the Tiers 1−4 described above, the WEG contains a *Tier 5 Other Post-Construction Studies*. In general, the studies identified in Tier 5 are research related and “will not be necessary for most wind energy projects”. Considering the site-specific and regional information collected

during the pre-construction period indicated low potential impacts, no Tier 5 studies are currently planned.

10.0 ADAPTIVE MANAGEMENT

Within the WEG, the USFWS defines adaptive management as "an iterative decision process that promotes flexible decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Comprehensively applying the tiered approach embodies the adaptive management process" (USFWS 2012). The WEG further notes adaptive management at most wind facilities is unlikely to be needed if they are sited in accordance with the tiered approach. Nevertheless, Dakota Range III recognizes the value of applying this approach to its Project activities that include some uncertainty. As such, Dakota Range III will incorporate an adaptive approach for the conservation of wildlife potentially impacted by the Project.

This BBCS describes the tiered approach used to study pre-construction wildlife conditions and predict Project impacts. Based on Project siting and the results of pre-construction wildlife studies, no significant adverse impacts are anticipated from the Project and mortality is expected to be within the overall range of other projects in the Midwest region. Tier 4 post-construction monitoring will be conducted to estimate the actual level of avian and bat mortality at the Project. If impacts are determined to be minimal, no further action may be needed. Should the results of the Tier 4 studies indicate higher than anticipated impacts, adaptive management measures could be considered to further avoid, minimize, or compensate for unanticipated and significant project impacts to wildlife. Thresholds for considering an adaptive response may include:

- Mortality of an eagle or a species state- or federally listed as endangered/threatened.
- Significant levels of mortality of unlisted species of birds or bats. Significance will be determined by qualified biologists and will be based on the latest information available, including the most recent data on species' population sizes and trends. For example, even relatively high levels of mortality of the most common species may not be significant. Conversely, lower levels of mortalities of less common species may be of more concern, particularly if these species appear to be at risk (e.g., USFWS BCC).

If effects are determined to be higher than anticipated, an assessment of why effects are occurring will be conducted to aid in developing appropriate mitigation actions. If causation of effects is unknown, further monitoring efforts may be implemented to help understand effects. Some of the adaptive management options could be considered depending on the results of the post-construction mortality monitoring and taking into account economic feasibility include:

- Additional on-site studies (e.g., more intensive area use studies, prey base studies).
- Addition or modification of anti-perching, anti-nesting, or electrocution protection devices on "problem" project facilities.
- Prey-base management through habitat alteration.

- Experimentation with visual and/or auditory bird flight diverters.

Once the mitigation measures are put into place, additional monitoring to determine the effectiveness of the mitigation measures may be conducted, and, depending on the results, further remedial measures may or may not be warranted.

11.0 CONCLUSIONS

This BBCS was written to provide guidance for avoiding, minimizing, and monitoring potential effects to avian and bat species at the Dakota Range III Wind Project. The measures described in this document are intended to help protect and reduce effects to avian and bat species during the construction phase of the Project, as well as to monitor potential effects to avian and bat species following implementation of the Project. Further, it is anticipated this BBCS will facilitate adaptive management at the Project based on information gathered following construction of the Project.

12.0 REFERENCES

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