Wildlife Conservation Strategy Campbell County Wind Farm 2 Project Campbell County, South Dakota



Prepared by:

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TABLE OF CONTENTS

1	INT	RODUCTION	1
	1.1 E	Background	1
	1.2 F	Purpose and Objectives	1
	1.3 F	Project Description	
	1.4 F	Regulatory Setting	5
	1.4.1	Federal Endangered Species Act	5
	1.4.2	Migratory Bird Treaty Act	8
	1.4.3	Bald and Golden Eagle Protection Act	8
	1.4.4	South Dakota State Threatened and Endangered Species	9
	1.5 A	gency Consultation	9
2	TIE	R 1 AND 2—DESKTOP ANALYSES	13
	2.1 T	iers 1 and 2—Preliminary Site Evaluation and Characterization	13
	2.1.1	Biological Assessment	14
	2.1.2	Prairie Grouse	18
	2.1.3	Whooping Crane Stopover Habitat Assessment	18
	2.1.4	Northern Long-eared Bat Desktop Habitat Assessment	20
3	TIE	R 3—BASELINE STUDIES	20
	3.1 E	agle and Avian Use Surveys	20
	3.2 F	Raptor Nest Surveys	23
	3.2.1	2021 Surveys	24
	3.2.2	2023 Surveys	24
	3.3 F	Prairie Grouse Lek Surveys	24
	3.3.1	2021 and 2023 Surveys	24
	3.4 F	Prairie Dog Colony Surveys	28
	3.5 E	Bat Acoustic Surveys	28
	3.5 E 3.6 N	Bat Acoustic Surveys Iorthern Long-eared Bat Presence/Absence Surveys	28 29
4	3.5 E 3.6 N PO	Bat Acoustic Surveys Iorthern Long-eared Bat Presence/Absence Surveys TENTIAL IMPACTS TO Wildlife	28 29 29
4	3.5 E 3.6 N PO 4.1 N	Bat Acoustic Surveys Iorthern Long-eared Bat Presence/Absence Surveys TENTIAL IMPACTS TO Wildlife Iethods	28 29 29
4	 3.5 E 3.6 N PO 4.1 N 4.2 E 	Bat Acoustic Surveys Iorthern Long-eared Bat Presence/Absence Surveys TENTIAL IMPACTS TO Wildlife Methods Birds	
4	3.5 E 3.6 N PO 4.1 N 4.2 E 4.2.1	Bat Acoustic Surveys Iorthern Long-eared Bat Presence/Absence Surveys TENTIAL IMPACTS TO Wildlife Methods Birds Fatality Estimates	
4	3.5 E 3.6 N PO 4.1 N 4.2 E 4.2.1 4.2.2	Bat Acoustic Surveys Iorthern Long-eared Bat Presence/Absence Surveys TENTIAL IMPACTS TO Wildlife Methods Birds Fatality Estimates Species Composition	
4	3.5 E 3.6 N PO 4.1 N 4.2 E 4.2.1 4.2.2 4.2.3	Bat Acoustic Surveys Iorthern Long-eared Bat Presence/Absence Surveys TENTIAL IMPACTS TO Wildlife Methods Birds Fatality Estimates Species Composition Direct Impacts: Avian Power Line Interactions	
4	3.5 E 3.6 N PO 4.1 N 4.2 E 4.2.1 4.2.2 4.2.3 4.2.4	Bat Acoustic Surveys Iorthern Long-eared Bat Presence/Absence Surveys TENTIAL IMPACTS TO Wildlife Methods Birds Birds Fatality Estimates Species Composition Direct Impacts: Avian Power Line Interactions Indirect Impacts	

	4.3		Bats	36
	4.	3.1	Direct Impacts	36
	4.	3.2	Indirect Impacts	39
	4.	3.3	Summary	39
	4.4		Other Wildlife	39
	4.	4.1	Summary of Potential Impacts	39
5		AV	OIDANCE AND MINIMIZATION MEASURES	40
	5.1		Conservation Measures Implemented During Site Selection and Project Design	40
	5.2		Conservation Measures to be Implemented during Construction	41
	5.3		Conservation Measures to be Implemented during Operations	43
6		TIE	ER 4—POST-CONSTRUCTION AVIAN AND BAT MONITORING	44
	6.1		Monitoring Goals	44
7		TIE	ER 5—OTHER POST-CONSTRUCTION STUDIES	45
8		AD	DAPTIVE MANAGEMENT	45
9		KE	Y RESOURCES	46
1()	RE	FERENCES	46
	10.1		Literature Cited	46
	10.2		Acts, Rules, and Regulations	53

LIST OF TABLES

Table 1.1	Relationship between Campbell County Wind Farm 2 Project Wildlife Conservation Strategy Sections and US Fish and Wildlife Service (USFWS) <i>Land-</i> <i>based Wind Energy</i> Guidelines Sections
Table 1.2.	Land cover types, coverage, and percent (%) composition within the Campbell County Wind Farm 2 Project in Campbell County, South Dakota
Table 2.1.	Federal- and state-listed and candidate wildlife species and their likelihood of occurrence within the Campbell County Wind Farm 2 Project in Campbell County, South Dakota adapted from Wenck Associates Inc. (2014)
Table 3.1.	Species of concern (number of groups [# grps] and individual observations [# obs]) observed during combined avian use surveys and incidental observations at the Campbell County Wind Farm 2 Project in Campbell County, South Dakota, from June 21, 2020 – May 19, 2021, and March 26, 2023 – February 19, 202422
Table 3.2.	Raptor nests identified during 2021 raptor nest surveys at Campbell County Wind Farm 2 Project in Campbell County, South Dakota27
Table 3.3.	Raptor nests identified during 2023 raptor nest surveys at Campbell County Wind Farm 2 Project in Campbell County, South Dakota27

Table 3.4.	Maximum count and activity status of prairie grouse surveyed during 2021 and 2023 lek surveys conducted at the Campbell County Wind Farm 2 Project in Campbell County, South Dakota	28
Table 4.1.	Summary of fatality estimates for all birds from multiple spatial scales in the US. ¹	32
Table 4.2.	Summary of fatality estimates for diurnal raptors from multiple spatial scales in the US. ¹	32
Table 4.3.	Avian species of concern observed at the Campbell County Wind Farm 2 Project in Campbell County, South Dakota, and total number of fatalities recorded at multiple spatial scales in the US. ¹	35
Table 4.4.	Summary of fatality estimates for bats from multiple spatial scales in the US. ¹	37
Table 4.5.	Bat species of concern with the potential to occur at the Campbell County Wind Farm 2 Project in Campbell County, South Dakota, and total number of fatalities recorded at multiple spatial scales in the US. ¹	37

LIST OF FIGURES

Figure 1.1. Location of the Campbell County Wind Farm 2 Project in Campbell County, South Dakota.	2
Figure 1.2. Land cover types within the Campbell County Wind Farm 2 Project in Campbell County, South Dakota	4
Figure 1.3. Protected areas near the Campbell County Wind Farm 2 Project in Campbell County, South Dakota	6
Figure 1.4. Water resources near the Campbell County Wind Farm 2 Project in Campbell County, South Dakota	7
Figure 2.1. Sharp-tailed grouse priority habitat areas in the current Campbell County Wind Farm 2 Project in Campbell County, South Dakota	19
Figure 3.1. Avian use survey points at the Campbell County Wind Farm 2 Project in Campbell County, South Dakota, during Year 1 and Year 2. ¹	21
Figure 3.2. Location of raptor nests identified during surveys in 2021 and 2023 for the Campbell County Wind Farm 2 Project in Campbell County, South Dakota	25
Figure 3.3. Location of prairie grouse leks within the Project and Survey Areas at the Campbell County Wind Farm 2 Project in Campbell County, South Dakota	26
Figure 4.1. Spatial scales (Bird Conservation Region 11, US Fish and Wildlife Service Mountain-Prairie Region, US Environmental Protection Agency Level I Ecoregion [Great Plains]) examined for avian and bat impacts relative to the Campbell County Wind Farm 2 Project in Campbell County, South Dakota	31
Figure 4.2. Fatalities of bird types at multiple spatial scales in the US (Western EcoSystems Technology, Inc. 2023).	34
Figure 4.3. Fatalities of bat species at multiple spatial scales in the US (Western EcoSystems Technology, Inc. 2023).	38

LIST OF APPENDICES

- Appendix A. Campbell County Wind Farm 2 Project, Biological Assessment—Report
- Appendix B. US Fish and Wildlife Service Information for Planning and Consultation Query for Listed and Sensitive Resources for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota
- Appendix C. Campbell County Wind Farm 2 Project, Northern Long-eared Bat Desktop Summer Habitat Assessment, Campbell County, South Dakota
- Appendix D. 2020–2021 Avian Use Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota
- Appendix E. 2021 Raptor Nest Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota
- Appendix F. 2023 Raptor Nest Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota
- Appendix G. 2021 Lek Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota
- Appendix H. 2023 Lek Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota
- Appendix I. 2021 Prairie Dog Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota
- Appendix J. 2019–2020 Bat Acoustic Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota
- Appendix K. Consistency Evaluation Forms for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota
- Appendix L. 2023–2024 Avian Use Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota

1 INTRODUCTION

1.1 Background

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 have been found to result in fatalities or indirect effects, including displacement and habitat loss. To address these concerns, Campbell County Wind Farm 2, LLC (Campbell County 2), contracted Western EcoSystems Technology, Inc. (WEST) to develop this site-specific Wildlife Conservation Strategy (WCS, formerly known as Bird and Bat Conservation Strategy) for the Campbell County Wind Farm 2 Project (Project) in Campbell County, South Dakota. This WCS outlines various processes Campbell County 2 has employed and/or will employ to 1) comply with all state and federal wildlife conservation and protection laws and regulations applicable to the Project; 2) ensure effects to avian and bat resources are identified, quantified to the extent possible, and analyzed; and 3) avoid, minimize, and mitigate potential effects to wildlife consistent with the US Fish and Wildlife Service (USFWS) *Land-based Wind Energy Guidelines* (WEG; 2012).

1.2 Purpose and Objectives

Federal laws and regulations protect most birds found in and around the Project Area (Figure 1.1), 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 the WCS is to meet the intent of these regulations and guidelines by reducing and managing the risk to avian and other wildlife species. This WCS has been voluntarily prepared as a good faith effort by Campbell County 2 to provide a written record of the Project's efforts to characterize avian and bat resources within the Project Area, assess potential impacts to avian and bat resources, and to document conservation measures that have been or will be taken to avoid, minimize, and/or mitigate for those potential impacts. The studies followed a tiered approach consistent with the WEG to inform these efforts. Table 1.1 explains links between the WCS and WEG tiers. Additionally, South Dakota has developed The *Siting Guidelines for Wind Power Projects in South Dakota*. This WCS is consistent with the South Dakota siting guidelines.



Figure 1.1. Location of the Campbell County Wind Farm 2 Project in Campbell County, South Dakota.

Table 1.1 Relationship between Campbell County Wind Farm 2 Project Wildlife Conservation Strategy Sections and US Fish and Wildlife Service (USFWS) Land-based Wind Energy Guidelines Sections.

WCS	USFWS Wind Energy Guidelines
Section 2: Tior 1 and 2 Site Characterization	Tier 1: Preliminary Site Evaluation
	Tier 2: Site Characterization
Section 2: Field Studios	Tier 3: Field Studies to Document Site Wildlife and
	Habitat
Section 4: Potential Impacts to Birds and Bats	Predict Project Impacts
Section 5: Avoidance and Minimization Measures	Best Management Practices
Section 6: Post-construction Wildlife Monitoring	Tier 4: Post-construction Studies to Estimate Impacts

Source: USFWS 2012.

Campbell County 2 developed this WCS to meet the following objectives:

- 1) Document correspondence with federal and state agencies throughout the development of the Project.
- 2) Document results of the Project's desktop and field surveys and their progression through the WEG Tiers.
- 3) Assess potential impacts to birds, bats, and other wildlife from the Project.
- 4) Identify measures that, when implemented during construction, operation, maintenance, and decommissioning at the Project, will avoid and minimize potential impacts to wildlife.
- 5) Describe post-construction monitoring and adaptive management procedures.

This WCS is a living document that will evolve throughout the life of the Project, as needed, in response to changing conditions. Additional information from avian and bat survey results, changes in our understanding of how birds and bats interact with wind turbines, or new minimization measures could be included in updated versions. Thus, the WCS is current at the time of writing, and modifications will be noted in the Document Version Tracking table presented earlier. This WCS will cover the anticipated 30-year functional life of the Project and potential extended operations and/or decommissioning period. Should the Project be re-powered, the WCS will remain in effect until decommissioning occurs.

1.3 **Project Description**

The Project Area is defined as approximately 11,993 acres (4,854 hectares [ha]) in Campbell County, South Dakota, approximately four miles (six kilometers [km]) northwest of Mound City, South Dakota (Figure 1.1). The Project Area is within the Bird Conservation Region (BCR) 11 (Prairie Potholes [US North American Bird Conservation Initiative 2021] and two Level IV ecoregions, the Southern Missouri Coteau Slope and the Missouri Coteau Slope (US Environmental Protection Agency [USEPA] 2012). These ecoregions, historically dominated by grasslands, have been largely converted for agricultural use (e.g., row crops and livestock grazing; USEPA 2012), and include some wetland and riparian areas. The dominant land cover type within the current Project Area is grasslands/herbaceous, representing 52.4% of the land cover followed by cultivated crops (41.7%; Figure 1.2, Table 1.2). Additional land cover types included developed (2.2%), hay/pasture (1.9%), and emergent herbaceous wetlands (1.7%). All remaining land cover types in the Project Area were less than 0.2% collectively (Table 1.2).



Figure 1.2. Land cover types within the Campbell County Wind Farm 2 Project in Campbell County, South Dakota.

NLCD Land Cover Type	Coverage (acres)	Coverage (hectares)	Percent Composition
Herbaceous	6,289	2,545	52.4
Cultivated crop	4,998	2,023	41.7
Developed	260	105	2.2
Hay/Pasture	226	92	1.9
Emergent herbaceous wetlands	202	82	1.7
Open water	10	4	0.1
Deciduous forest	6	2	<0.1
Woody wetlands	1	<1	<0.1
Total ¹	11,993	4,854	100

 Table 1.2. Land cover types, coverage, and percent (%) composition within the Campbell County

 Wind Farm 2 Project in Campbell County, South Dakota.

^{1.} Sums of values may not add to totals shown due to rounding.

Source: National Land Cover Database (NLCD) 2019.

Topography within the Project Area varies from relatively flat to rolling uplands, with elevations ranging from 1,647–2,103 feet (502–641 meters [m]) above mean sea level (US Geological Survey [USGS] 2021). Land ownership within the Project Area is private (USGS Gap Analysis Project 2022; Figure 1.3). Wetlands are sparsely dispersed, comprising less than 4% of the Project Area. Approximately 79% of the wetlands are freshwater emergent, 11% are freshwater ponds, 10% are riverine, and the remainder are freshwater forested/shrub wetland (USFWS National Wetlands Inventory [NWI] 2023; Figure 1.4). There is one large freshwater emergent wetland located in the southeastern portion of the Project Area and includes 228 acres (92 ha). This wetland is located along either side of an unnamed tributary to Olson Creek; the tributary enters Olson Creek at approximately the west end of Lake Campbell. Olson Creek is located in the southern portion of the Project and Spring Creek briefly enters the Project in the northeast.

Infrastructure for the Project will include 29 General Electric 3.4-megawatt (MW) turbines, 10 miles (16 km) of new access roads, and 24 miles (39 km) of underground electrical collector lines and cables. There will be use of an existing operations and maintenance facility for this Project from an adjacent project, Campbell County Wind Farm 1. Construction of the Project is scheduled to begin in Quarter 3 of 2025 and commercial operation is anticipated to begin in the third quarter of 2026.

1.4 Regulatory Setting

1.4.1 Federal Endangered Species Act

The ESA directs the USFWS to identify and protect endangered and threatened species and their critical habitat, and to provide a means to conserve their ecosystems. Among its other provisions, the ESA requires the USFWS to assess civil and criminal penalties for violations of the ESA or its regulations. Section 9 of the ESA prohibits the take of federally listed species. Take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" (16 US Code [USC] 1532 [1973]). The term "harm" includes significant habitat alteration which kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 Code of Federal Regulations [CFR] 17.3 [1975]). Projects involving Federal lands, funding or authorizations will require consultation between the Federal agency and the USFWS to avoid adversely impacting listed species and their critical habitat.



Figure 1.3. Protected areas near the Campbell County Wind Farm 2 Project in Campbell County, South Dakota.



Figure 1.4. Water resources near the Campbell County Wind Farm 2 Project in Campbell County, South Dakota.

1.4.2 Migratory Bird Treaty Act

The federal regulatory framework for protecting bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles includes the MBTA (16 USC §§ 703-712 [1918]). In the US, the MBTA is the cornerstone of migratory bird conservation and protection. The MBTA implements four treaties that provide international protection of migratory birds. The take prohibition for MBTA states:

"Unless and except as permitted by regulations...16 US Code 703, it shall be unlawful at any time, by any means, or in any manner to pursue, hunt, take, capture, kill...possess, offer for sale, sell...purchase...ship, export, import...transport or cause to be transported...any migratory bird, any part, nest, or eggs of any such bird...[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."

The word "take" is defined by regulation as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 CFR 10.12 [1973]). The USFWS maintains a list of all species protected by the MBTA at 50 CFR 10.13 (1973). This list includes more than one thousand species of migratory birds, including eagles and other raptors, waterfowl, shorebirds, seabirds, wading birds, and passerines.

1.4.3 Bald and Golden Eagle Protection Act

Under authority of the BGEPA, 16 USC 668–668d (1940), bald eagles and golden eagles are afforded 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 (see 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 2024, the USFWS revised the permit regulations for incidental take of eagles under 50 CFR 22. *The Permits for Incidental Take of Eagles and Eagle Nests* (2024 Eagle Rule; USFWS 2024) included the creation of a general permit option (50 CFR 22 Subpart E § 22.250) for authorizing incidental take at a wind facility "that occur frequently enough for the Service to have developed a standardized approach to permitting and ensure permitting is consistent with the preservation standard." To be eligible for a general permit, a wind facility must 1) be in an area with relative abundance below the seasonal thresholds identified by the USFWS for both eagle species, and 2) not have a golden eagle nest within 2.0 miles (3.2 km) or a bald eagle nest within 660 feet (201 m) of turbine blades or other turbine infrastructure (USFWS 2024). Project proponents who desire to obtain incidental take authorization but are ineligible for a general permit may apply for a "specific permit" (50 CFR § 22.200) in much the same way as permits were issued under the 2016 Eagle Rule. However, the 2024 Eagle Rule also created a tiered process for specific permit

applications (and associated permit fees) based on the level of complexity and anticipated processing times associated with an application. For all eagle incidental take permits, the USFWS continues to require implementation of all practicable avoidance and minimization measures to reduce the likelihood of take.

1.4.4 South Dakota State Threatened and Endangered Species

South Dakota's Endangered Species Statute (Title 34A Chapter 8) requires the South Dakota Department of Game, Fish and Parks (SDGFP) and the US Department of Agriculture (USDA) to perform those acts necessary for the conservation, management, protection, restoration, and propagation of endangered, threatened, and nongame species of wildlife. In accordance with this mandate, the SDGFP has drafted a Wildlife Action Plan, which includes a list of Species of Greatest Conservation Need (SGCN; SDGFP 2023b). In addition to endangered and threatened species, the SGCN list includes species that are regionally or globally imperiled (or secure) and for which South Dakota represents an important portion of their remaining range and species with characteristics that make them vulnerable. The resulting List of Endangered, Threatened, and SGCN species is promulgated by the Game, Fish and Parks Commission and reviewed biennially. The Endangered Species Statute also authorizes the Secretary of Agriculture and the Secretary of SDGFP to enter cooperative agreements with federal or state agencies or private persons for management of nongame, endangered, threatened species. The South Dakota Endangered Species Statute defines endangered, threatened, nongame, and wildlife species as follows:

- Endangered (E)—any species of wildlife or plants which is in danger of extinction throughout all or a significant part of its range other than species of insects determined by the SDGFP Commission or the secretary of the US Department of Interior to constitute a pest whose protection under this chapter would present an overwhelming and overriding risk to man.
- Nongame species (NG)—any wildlife species not legally classified as a game species, furbearer, threatened species, or as endangered by statute or regulations of this state.
- Threatened (T)—any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- Wildlife species—any non-domesticated animal, whether reared in captivity or not, and includes any part, product, egg, or offspring thereof, or the dead body or parts thereof.

1.5 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. Additionally, Campbell County will be distributing generated power though the Western Area Power Administration's (WAPA) Bismarck to Glenham transmission line which is a federal action subject to the National Environmental Policy Act (NEPA). WAPA prepared an Environmental Assessment (EA) as part of the NEPA process. Agencies can help developers identify potential biological resource issues early in the development process. Throughout Project planning and development, Campbell County 2 coordinated with federal and state agencies to address potential wildlife and

habitat concerns. Bird and bat baseline studies were designed based on both the recommendations of SDGFP and USFWS, and in accordance with the WEG.

Location: Email Correspondence

Date/Time: July 20, 2020

Correspondent: Casey Heimerl, SDGFP

- **Objective:** Objective was to provide information on northern long-eared bat (*Myotis septentrionalis*; NLEB) information in Campbell County, South Dakota, for a proposed wind farm.
- **Discussion Topics:** An information request was provided to SDGFP Natural Heritage Database on July 27, 2020, for any confirmed NLEB hibernacula or known foraging, roosting, or commuting habitats within Campbell County, South Dakota. The response from SDGFP was that there were no known records of NLEB in Campbell County, South Dakota.

Location: Webinar

Date: March 16, 2021

Attendees: SDGFP, ConEdison Clean Energy Business, LLC (ConEdison), and WEST

- **Objective:** Objective was to introduce the Project to the agency and provide an overview of the Project along with completed studies and proposed studies for 2021–2022.
- Discussion Topics: ConEdison provided an overview and proposed development schedule of the Project. WEST presented the studies that were completed, ongoing, or proposed in 2021–2022 and solicited feedback from SDGFP on design and effort. Completed studies included sharp-tail grouse lek surveys (2011), raptor nest surveys (2010, 2012, 2017, 2018), bat acoustic surveys (2011), eagle use surveys (2019–2020), and NLEB summer roost habitat assessment (2020); ongoing studies included avian use (2020–2021). Proposed efforts included additional raptor nest and prairie grouse (collectively sharptailed grouse (*Tympanuchus phasianellus*) and greater prairie-chicken (*Tympanuchus cupido*) lek surveys, prairie dog (*Cynomys* spp.) colony mapping, and updates to native prairie mapping. SDGFP discussed recommended setbacks of 1.0 miles (1.6 km) for no surface occupancy for active leks and 2.0 miles from active leks for construction during the lekking season (March 20 – May 7). SDGFP expressed their preference for aerial lek surveys with follow-up ground-based surveys. SDGFP also suggested avoiding turbine placement in grasslands and wetland complexes.

Location: Webinar

Date: March 18, 2021

Attendees: USFWS, ConEdison, and WEST

- **Objective:** Objective was to introduce the Project to the agency and provide an overview of the Project along with completed studies and proposed studies for 2021–2022.
- **Discussion Topics:** ConEdison provided an overview and proposed development schedule of the Project. WEST presented the studies that were completed, ongoing, or proposed in

2021–2022 and solicited feedback from USFWS on design and effort. Completed studies included sharp-tail grouse lek surveys (2011), raptor nest surveys (2010, 2012, 2017, 2018), bat acoustic surveys (2011), eagle use surveys (2019–2020), and NLEB summer roost habitat assessment (2020); ongoing studies included avian use (2020–2021). Proposed efforts included additional raptor nest and prairie grouse lek surveys, prairie dog colony mapping, and updates to native prairie mapping. USFWS discussed grassland impact avoidance recommendations, including potential buffers and a qualitative assessment. USFWS also recommended presence/absence surveys based on a habitat assessment for NLEB, and to include little brown bat (*Myotis lucifugus*) and tricolored bat (*Perimyotis subflavus*). USFWS suggested a wetland evaluation and monitoring for whooping crane (*Grus americana*) at the Project due to its location within the migration corridor. USFWS suggested following whooping crane guidance found in the Upper Great Plains Programmatic Environmental Impact Statement (UGP PEIS; WAPA and USFWS 2015).

Location: Email Correspondence

- Date/Time: April 14, 2021
- Correspondent: Casey Heimerl, SDGFP
- **Objective:** Objective was to provide information on occurrence of any protected, rare species, or rare habitat information within two miles of the proposed wind farm in Campbell County, South Dakota.
- **Discussion Topics:** An information request was provided to SDGFP Natural Heritage Database on April 14, 2021, for protected, rare species, or rare habitat information in Campbell County, South Dakota, for a proposed wind farm. This included specific requests for known eagle nests, ESA- or state-listed species occurrence, known bat roosting or hibernacula, known lek sites, and sensitive habitats. The response from SDGPF was that there was one bald eagle nest within 2.0 miles of the Project location, and no known lek locations within 2.0 miles of the Project. However, it was noted that the department's prairie grouse occupancy modeling efforts suggested good habitat within the Project boundary and probability of occurrence was relatively high.

Location: Email Correspondence

Date/Time: July 14, 2021

- Correspondent: Hilary Morey, SDGFP
- **Objective:** Objective was to provide information and recommendations for the development and siting of the proposed wind facility.
- **Discussion Topics:** A variety of recommendations were provided based on SDGFP's assessment of the Project Area. SDGFP recommended placing infrastructure in disturbed areas as much as possible, while avoiding grasslands, especially undisturbed grasslands, as well as wetland and wetland complexes. SDGFP recommended siting turbines at least 1,000 feet (305 m) from suitable bat habitat (e.g., forested areas, woody draws) and avoiding prairie dog colonies. SDGFP advised construction should be avoided within

2.0 miles of active grouse leks during the lekking season (March 1 – June 1), and siting infrastructure within 1.0 mile of active grouse leks should be avoided. SDGFP recommended development of a whooping crane contingency plan (to include a detailed contact tree) and a Bird and Bat Conservation Strategy/Wildlife Conservation Plan. SDGFP recommended noxious weed control and revegetation of disturbed areas with native, weed-free seed mixes. SDGFP suggested following Avian Power Line Interaction Committee (APLIC) guidelines for designing and marking powerlines and recommended at least two years of post-construction mortality monitoring *or* a post-construction project focused on grassland nesting birds within the Project Area.

Location: Webinar

Date/Time: September 20, 2022

Correspondent: SDGFP, ConEdison, WEST, and WAPA

- **Objective:** Objective was to provide Project specification updates and review existing wildlife studies and proposed studies for 2023.
- Discussion Topics: ConEdison provided an overview of the proposed 98.9-MW Project to the agencies, with an anticipated Commercial Operation Date of 2026. WEST provided a review of completed surveys and discussed proposed efforts for the Project, including avian use surveys, raptor nest surveys, lek surveys, whooping crane stopover habitat assessment, grassland assessment, NLEB surveys, and a WCS. SDGFP recommended ground-based surveys for prairie grouse (Tympanuchus spp.) beginning the first week of April, stating results would be good for two subsequent years. SDGFP emphasized the importance of not only untilled grasslands, but hay lands, pasture, and Conservation Reserve Program grasslands. SDGFP stated peregrine falcon (Falco peregrinus) has been downlisted to State Threatened. WAPA recommended bi-annual whooping crane monitoring be carried out during operation, and a chain of command and operational procedures be included in the WCS since the Project falls within the 50% whooping crane migration corridor. WAPA cited a Pearse et al. (2021) paper emphasizing there may be a 12.4 miles (20.0 km) "area of deflection" to consider for impacts. In addition to the proposed lek survey methodology, WAPA recommended additional lek surveys be conducted along publicly accessible roads while traveling between historic leks. ConEdison concurred with this request and included surveys along publicly assessable roads.

Location: Letter Correspondence

Date/Time: July 28, 2023

Correspondent: Luke Toso, Amity Bass, North and South Dakota USFWS Field Offices

- **Objective:** Objective was to provide an authorization letter from the USFWS to conduct mistnetting surveys for the federally listed as endangered NLEB.
- **Discussion Topics:** On June 23, 2023, WEST provided an authorization request to conduct NLEB mist-netting surveys following the 2023 USFWS survey guidance recommendations. This request included a study plan for the USFWS Ecological Services

Field Office to review and authorize, if warranted. On July 28, 2023, the USFWS Ecological Services Field Office provided a response letter to Campbell County 2 authorizing the surveys with an additional recommendation. Campbell County 2 reviewed the additional recommendation and agreed to all additional conditions requested beyond the original request for the upcoming surveys.

2 TIER 1 AND 2—DESKTOP ANALYSES

Characterization of biological resource issues early in the development phase of a wind energy project helps identify, avoid, and minimize potential wildlife impacts associated with project development. At each tier, potential issues associated with the development or operations of a 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, bat, or other wildlife issues are better understood. This approach ensures that sufficient data are collected to enable Campbell County 2 to make informed decisions regarding the Project while ensuring they are complying with their corporate environmental policy.

The primary data sources examined during the initial desktop review included those listed in Table 2.1. In addition to the sources listed in Table 2.1, SDGFP developed a tiered prairie grouse habitat layer based on data presented in Runia et al. (2021) described in the 2022 Management of Prairie Grouse in South Dakota, 2022–2031 (SDGFP 2022). The top three grouse priority tiers were overlaid across the Project Area as described by SDGFP (2022). From these sources, a land cover map, a desktop wetlands map, and a list of species of concern (SOC) possibly occurring in the Project Area and their typical habitat requirements were created. SOC are defined as federally listed species under the ESA, eagle species subject to the BGEPA; species state-classified as threatened, endangered, or as a SGCN by the SDGFP; and USFWS Birds of Conservation Concern (BCC) for BCR 11.

2.1 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. The objective of the Tier 1 study is to assist the developer in further identifying a potential wind energy site. Tier 1 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 regarding flora and fauna. The objective of Tier 2 studies is to determine potential effects of the proposed project on any federal- and state-listed sensitive species. Tier 2 studies typically include a more substantive review of existing information, including publicly available data on land use and land cover, topography, wetland data, wildlife, habitat, and sensitive plant distribution, a reconnaissance-level site visit (to confirm presence of habitat types), and contacting the agencies involved.

2.1.1 Biological Assessment

In 2014, a biological assessment was conducted to address the recommendations of a Tier 2 study described in the WEG (Wenck Associates Inc. 2014; Appendix A). This study described potentially sensitive habitats and associated wildlife. The review of federally protected species identified five species that could potentially occur in Campbell County, South Dakota, including whooping crane, piping plover (*Charadrius melodus*) and its designated critical habitat,¹ interior least tern (*Sternula antillarum athalassos*), Sprague's pipit (*Anthus spragueii*), and pallid sturgeon (*Scaphirhynchus albus*; Table 2.1).

A landscape-scale analysis was conducted to determine potential occurrence and risk to whooping crane in the Project Area, plus a 10.0-mile buffer surrounding the Project Area. The Project Area and buffer were characterized as 97.4% wetland-agriculture matrix, providing suitable roosting and foraging habitat; however, less than 4% of the Project Area is comprised of wetlands. It was determined the risk of adverse effects were expected to be negligible based on conservation measures implemented by the client.

Since the original work in 2014, an updated SOC list with current information as of the date of this WCS is provided in Table 2.1 and includes all species defined as SOC. Table 2.1 provides a list of species with potential to occur in the Project Area, including state-listed threatened and endangered species, federal ESA and BGEPA species, South Dakota SGCN species, and BCC species found in the Prairie Pothole BCR 11 (USFWS 2021a) and their likelihood of occurrence by season.

The likelihood of a SOC occurring in the Project Area was determined by considering the species' range, known occurrences and habitat associations. Based on these factors, the likelihood of occurrence was defined for each SOC, using the following categories:

- None—outside the species' known range; no suitable habitat; restricted mobility; small population size; and/or believed extirpated.
- Unlikely—in the species' known range but suitable habitat appears absent; may have restricted mobility or population size; however, species may occur in the area during dispersal, migration, or annual movements.
- Possible—in the species' known range but suitable habitat is marginal or limited; or the species is highly mobile and may occur year-round.
- Likely—in the species' known range and contains suitable habitat, no records from the area.
- Occurs—records of species' occurrence in the area based on USFWS, SDGFP, or other survey data.

¹ Critical habitat is the specific areas within the geographic area, occupied by the species at the time it was listed, that contains the physical or biological features that are essential to the conservation of endangered and threatened species and that may need special management or protection (USFWS 2017)

 Table 2.1.
 Federal- and state-listed and candidate wildlife species and their likelihood of occurrence within the Campbell County Wind Farm 2 Project in Campbell County, South Dakota adapted from Wenck Associates Inc. (2014).

	-	-	Seasons of Potential Occurrence				
Common	Scientific	(Federal;	Habitat by Season/Equivalent National Land	Likelihood	of Occurre	nce² in the F	Project Area
Name	Name	State) ¹	Cover Database Land Cover Types	Spring	Summer	Fall	Winter
Birds							
bald eagle	Haliaeetus leucocephalus	BGEPA; SGCN	Nests in large trees during spring and summer; forages near water in steppe and shrub-steppe habitats in spring, summer, fall, and winter. Deciduous forest, evergreen forest, mixed forest, shrub/scrub, herbaceous.	Likely	Likely	Likely	Likely
black tern	Chlidonias niger	BCC; SGCN	Utilizes shallow wetland complexes, usually larger than 20.0 hectares, with open water and emergent vegetation.	Unlikely	Likely	Likely	None
bobolink	Dolichonyx oryzivorus	BCC; SGCN	Requires moderate to tall and dense vegetation and moderately deep litter in native and tame grasslands, hay lands, and pastures.	Occurs	Likely	Possible	None
ferruginous hawk	Buteo regalis	BCC; SGCN	Inhabits large areas of open grasslands and shrub communities.	Possible	Occurs	Possible	None
Franklin's gull	Leucophaeus pipixcan	BCC;	Nests in colonies in prairie wetlands with emergent vegetation.	Unlikely	Occurs	Possible	None
golden eagle	Aquila chrysaetos	BGEPA;	Nests in trees and cliffs during spring and summer; forages in shrub-steppe habitats spring, summer, fall, and winter. Herbaceous.	Possible	Possible	Likely	Likely
interior least tern	Sternula antillarum athalassos	; SE, SGCN	Breeds along the Missouri and Cheyenne River, utilizing sandbars with sparse vegetation.	Unlikely	Possible	Possible	None
marbled godwit	Limosa fedoa	BCC; SGCN	Utilizes a variety of wetlands and nests in grazed native prairie.	Unlikely	Possible	Unlikely	None
osprey	Pandion haliaetus	; ST, SGCN	Breeds and forages near rivers, lakes, ponds. Nests in large open-top trees.	Unlikely	Unlikely	Unlikely	None
peregrine falcon	Falco peregrinus	; ST, SGCN	Nests along cliffs and rock outcroppings. Forages in open grasslands.	Unlikely	Occurs	Unlikely	None
piping plover	Charadrius melodus	FT; ST, SGCN	Breeds along small alkaline lakes, large reservoirs, or river islands and sandbars.	Unlikely	Unlikely	Unlikely	None
red-headed woodpecker	Melanerpes erythrocephalus	BCC; SGCN	Requires natural stands of mature deciduous trees.	Unlikely	Occurs	Unlikely	None
rufa red knot	Calidris canutus rufa	FT;	Migration and stopover habitat includes coastal habitats beach and mudflat habitats.	Unlikely	Unlikely	Unlikely	None

Table 2.1.	Federal- and state-listed and can	lidate wildlife species ar	nd their likelihood of o	ccurrence within the (Campbell County Wind
	Farm 2 Project in Campbell Count	y, South Dakota adapted	d from Wenck Associate	s Inc. (2014).	

	-	Status	-	Seaso	ns of Poten	tial Occurre	nce and
Common	Scientific	(Federal;	Habitat by Season/Equivalent National Land	Likelihood	of Occurre	nce² in the F	Project Area
Name	Name	State) ¹	Cover Database Land Cover Types	Spring	Summer	Fall	Winter
sharp-tailed grouse	Tympanuchus phasianellus	;	Occurs within prairie dominated landscapes, field edges and some croplands. Herbaceous/Crops	Occurs	Occurs	Occurs	Occurs
Sprague's pipit	Anthus spragueii	; SGCN	Requires large areas of native mixed-grass prairie.	Unlikely	Possible	Possible	None
western grebe	Aechmophorus occidentalis	BCC;	Requires large lakes with emergent vegetation for breeding; open water is preferred for foraging and courtship.	Unlikely	Possible	Possible	None
whooping crane	Grus americana	FE*; SE, SGCN	Occupies a variety of wetland and other habitats, including coastal marshes and estuaries, inland marshes, lakes, ponds, wet meadows and rivers, agricultural fields, and wetlands.	Possible	Possible	Possible	None
Insects							
monarch butterfly	Danaus plexippus	FC;	Breeds and forages on various milkweed (<i>Asclepias</i> spp.) within a variety of habitats including rangelands, agricultural areas, riparian habitats, and wetlands.	Occurs	Occurs	Occurs	Occurs
Fishes							
banded killfish	Fundulus diaphanous	; SE, SGCN	Prefers shallow lakes, ponds, and streams with sandy, gravel substrate and ample aquatic vegetation.	Unlikely	Unlikely	Unlikely	Unlikely
pallid sturgeon	Scaphirhynchus albus	FE; SE, SGCN	Found in the Missouri River in swift currents with sandy, gravel substrate.	None	None	None	None
Mammals							
black-footed ferret	Mustela nigripes	FE; SE, SGCN	Reliant on prairie dog colonies for shelter and prey.	Unlikely	Unlikely	Unlikely	Unlikely
eastern red bat	Lasiurus borealis	; SGCN	Summer roosts underneath bark, in cavities, or crevices of live trees and snags. Winters in caves and mines. Forested Emergent Wetlands/Mixed/ Conifer/Deciduous Forests	Likely	Occurs	Likely	None
hoary bat	Lasiurus cinereus	; SGCN	Usually not found in man-made structures; roosts in trees.	Likely	Occurs	Likely	None

 Table 2.1.
 Federal- and state-listed and candidate wildlife species and their likelihood of occurrence within the Campbell County Wind

 Farm 2 Project in Campbell County, South Dakota adapted from Wenck Associates Inc. (2014).

0	Status		Liekitet ha Osessa / Envirolant National Land	Seasons of Potential Occurrence and			
Common Name	Name	(Federal; State) ¹	Cover Database Land Cover Types	Spring	Summer	Fall	Winter
northern long- eared bat	Myotis septentrionalis	FE; SGCN	Summer roosts underneath bark, in cavities, or crevices of live trees and snags. Winters in caves and mines. Forested Emergent Wetlands/Mixed/ Conifer/Deciduous Forests	Possible	Possible	Possible	None
swift fox	Vulpes velox	; ST, SGCN	Habitat includes open gently rolling heavily grazed shortgrass or mixed-grass prairies.	Unlikely	Unlikely	Unlikely	Unlikely
tricolored bat	Perimyotis subflavus	FC; SGCN	Found in deciduous forest habitat roosting primarily among leaves; overwinters in caves and mines.	Unlikely	Unlikely	Unlikely	None

^{1.} BGEPA = Federal Bald and Golden Eagle Protection Act of 1940; BCC = Bird of Conservation Concern; FE = Federally listed endangered species; FC = Federal Candidate; SE = State-listed endangered species; ST = State-listed threatened species; SC = State candidate species; SGCN = Species of Greatest Concern Need.

^{2.} Likelihood of species to occur for breeding, nesting, spawning, migration, flowing, etc., based on the species' range, habitat suitability, species' mobility, population size, and records of occurrence in the appropriate area (Section 3.1). Seasonal likelihood of occurrence applies to the Project Area, Study Area, or neither (--) as shown under "Suitable Habitat".

Sources: NatureServe 2021; eBird 2023; South Dakota Game, Fish and Parks 2023a; US Fish and Wildlife Service (USFWS) 2023a (Appendix B), 2023b.

2.1.2 Prairie Grouse

Two species of prairie grouse reside within South Dakota, the sharp-tailed grouse and greater prairie-chicken (SDGFP 2023b). Both are valued wildlife species because of their status as game birds, charismatic lekking behavior, and habitat use (SDGFP 2023b). Sharp-tailed grouse have a wide distribution from Alaska to the Great Plains and in South Dakota, they are a common resident west of the Missouri River and on the Missouri and Prairie coteau east of the Missouri River (Runia et al. 2021). In contrast, greater prairie-chicken now only occurs in isolated populations from eastern North Dakota to central Wisconsin, and as far south as northeast Oklahoma. In South Dakota, greater prairie-chickens occur in the northeast part of the state, but the densest and most stable populations occur south of the Project in the center of the state south to Nebraska (Runia et al. 2021).

The primary objective of this desktop analysis was to evaluate habitat quality for prairie grouse in relation to the Project Area. Currently, there are three-tiered Priority Habitat Areas to assess landscape level habitat quality for prairie grouse species in South Dakota (SDGFP 2022). Tier 1 is the highest quality habitat, followed by Tier 2 and Tier 3. Areas not categorized as Tier 1, 2, or 3 are considered Low-Quality habitat (Runia et al. 2021, SDGFP 2022). There are Tier 1, 2, and 3 habitats in the Project Area for sharp-tailed grouse (Figure 2.1). The Project is outside of the greater prairie-chicken tiered habitat model.

2.1.3 Whooping Crane Stopover Habitat Assessment

The objective of the whooping crane stopover habitat assessment was to evaluate potentially suitable whooping crane stopover habitat within the Project Area. A desktop review and analysis of potential whooping crane stopover habitat within and adjacent to the Project was conducted in 2023 using the Niemuth model (Niemuth et al. 2018, WAPA 2024). The whooping crane is federally listed as endangered and migrates through South Dakota to breeding grounds in Canada and wintering grounds in Texas along the Gulf of Mexico (Canadian Wildlife Service and USFWS 2007). The Project Area is within the 95% whooping crane migration corridor.

Niemuth et al. (2018) developed a model that used 13 variables to identify whooping crane relative probability of use across the landscape in North and South Dakota. This probability dataset was then divided into 10 equal-area bins, or deciles, to aid in conservation planning (Niemuth et al. 2018). For this Project, suitable habitat for whooping cranes was defined as wetlands (USFWS NWI 2023) that intersect the five highest use deciles (Niemuth et al. 2018).

To determine the total acreage of suitable whooping crane stopover habitat for mitigation, the total acres of wetland that overlapped with the five deciles of highest whooping crane use (Niemuth et al. 2018) within 0.5 mile (0.8 km) of proposed turbine locations was calculated following the UGP PEIS. This resulted in a total of 133.6 acres (54.1 ha) of suitable habitat.



Figure 2.1. Sharp-tailed grouse priority habitat areas in the current Campbell County Wind Farm 2 Project in Campbell County, South Dakota.

2.1.4 Northern Long-eared Bat Desktop Habitat Assessment

In 2021, WEST conducted a NLEB habitat assessment to identify potentially suitable summer roosting and foraging habitat within the Project Area and a 2.5-mile (4.0-km) area around the Project (collectively referred to as the Assessment Area; Piorkowski 2021b; Appendix C). The assessment of summer habitat for NLEB was completed in accordance with the 2024 *Range-Wide Indiana Bat & Northern Long-eared Bat Survey Guidelines* (USFWS 2024b).

Suitable NLEB summer habitat (forested areas, regardless of patch size) within the Assessment Area totaled 592.3 acres (239.7 ha). Within the Project Area, WEST determined there to be 27.0 acres (10.9 ha) of suitable habitat for NLEB.

3 TIER 3—BASELINE STUDIES

The baseline wildlife studies, and their corresponding survey efforts were designed to meet the regulatory guidelines in all years (USFWS 2012). Tier 3 pre-construction studies have been ongoing within the Project Area since 2020 and will continue in 2024. Baseline wildlife studies include the following: 1) Eagle and Avian Use Surveys; 2) Raptor Nest Surveys; 3) Prairie Grouse Surveys; and 4) Bat Acoustic Surveys. Details and summaries of the methods and results are provided in the sections below.

3.1 Eagle and Avian Use Surveys

Two years of avian use point-count surveys were completed for the Project to assess the temporal and spatial use of the Project Area by large and small birds, with a particular focus on eagles and other SOC following the recommendations in the *Eagle Conservation Plan* Guidance (USFWS 2013) and WEG (Piorkowski and Agudelo 2021b, Piorkowski and Chouinard 2024; Appendices D and L). SOC were defined in these studies as federal- or state-listed and candidate species, eagle species (protected under BGEPA), USFWS BCC in BCR 11, and/or SDGFP state SGCN.

In 2020, nine survey point locations were provided to WEST by Campbell County 2 with a 2,625-foot (800-m) radius covering approximately 45.9% of the Project Area, as no turbine layout was available. In January 2023, a turbine layout was provided. Recalculated survey coverage within the current minimum convex polygon (MCP) of 2020–2021 avian use survey plots was 28.0% and an additional survey point (Point 10; Figure 3.1) was added resulting in 34.8% MCP coverage of 2023–2024 survey plots.

Two years of surveys were conducted once per month between June 21, 2020 – May 19, 2021 (Year 1; Appendix D), and March 26, 2023 – February 19, 2024 (Year 2; Appendix L). During Year 1 surveys, small birds were recorded for the first 10 minutes (min) out to a 328-foot (100-m) radius and only large birds were recorded for the subsequent 60 min out to an 800-m radius. Year 2 surveys were only conducted for large birds. During both survey years, SOC were recorded during standardized surveys and incidentally.



Figure 3.1. Avian use survey points at the Campbell County Wind Farm 2 Project in Campbell County, South Dakota, during Year 1 and Year 2.¹

¹ Year 1 surveyed points 1–9 from June 21, 2020 to May 19, 2021; Year 2 surveyed points 1–10 from March 26, 2023 to February 19, 2024.

A total of 223 large bird surveys (223 hours of surveys) were conducted over the course of the two years of avian use studies. Twenty-five and 32 unique large bird species were observed in Year 1 and Year 2, respectively. Overall large bird mean use in Year 1 (9.31 observations/800-m radius plot/60-min survey) was considerably lower than in Year 2 (52.12) with waterfowl composing most of the Year 2 use. Seasonal large bird mean use across years was lowest in winter and highest during migration, largely due to use by waterfowl and/or waterbirds. A turnover in species groups' seasonal mean use was observed in Year 1 while in Year 2, except for summer when use by shorebirds was higher, seasonal mean use was dominated by waterfowl especially during fall, mostly due to a couple of large snow geese (*Anser caerulescens*) flocks.

Twenty-six unique small bird species were recorded during 108 surveys (18 hours of surveys) in Year 1, resulting in an overall small bird mean use of 4.11 observations/100-m radius plot/10-min survey, due almost exclusively to use by passerines. Seasonally, a turnover in species composition and mean use by species group was observed, with small bird mean use being highest during summer (mostly due to grassland/sparrows) and fall (mostly due blackbirds/orioles) compared to spring and winter (when only three unique small bird species were observed).

Diurnal raptors were consistently observed across seasons and years except for winter of Year 2, with mean use being similar between years, ranging from 0.11–0.63 observations/800-m radius plot/60-min survey in Year 1 and 0.20–047 in Year 2. No eagles were observed during standardized avian use surveys conducted for the Project; however, a total of three bald eagles (BGEPA and SGCN) were recorded incidentally in Year 1 and Year 2 in the vicinity of Point 8, and one golden eagle (BGEPA) was recorded incidentally in Year 2, in the vicinity of Point 10. No federal-listed species were observed, and one observation of a state-listed threatened species (peregrine falcon) was recorded during standardized surveys (Table 3.1).

Other large bird SOC observed included American white pelican (*Pelecanus erythrorhynchos*; SGCN), ferruginous hawk (*Buteo regalis*; SGCN), Franklin's gull (*Leucophaeus pipixcan*; BCC), and northern harrier (*Circus hudsonius*; BCC). Additionally, three small BCC were observed during surveys or incidentally, including grasshopper sparrow (*Ammodramus savannarum*), bobolink (*Dolichonyx oryzivorus*), and red-headed woodpecker (*Melanerpes erythrocephalus*; Table 3.1).

50116×1 , $2020 = 101ay 13$, 2021 , and 1010×100 , $2023 = February 13$, 2024 .								
	-		Surveys		Incidental		Total	
Species	Scientific Name	Status ¹	# grps	# obs	# grps	# obs	# grps	# obs
American white pelican	Pelecanus erythrorhynchos	SGCN	1	1	0	0	1	1
bald eagle	Haliaeetus leucocephalus	SGCN; BGEPA	0	0	2	3	2	3
golden eagle	Aquila chrysaetos	BGEPA	0	0	1	1	1	1
ferruginous hawk	Buteo regalis	SGCN	1	1	0	0	1	1
Franklin's gull	Leucophaeus pipixcan	BCC	5	42	0	0	5	42

Table 3.1.Species of concern (number of groups [# grps] and individual observations [# obs])
observed during combined avian use surveys and incidental observations at the
Campbell County Wind Farm 2 Project in Campbell County, South Dakota, from
June 21, 2020 – May 19, 2021, and March 26, 2023 – February 19, 2024.

Table 3.1.	Species of concern (number of groups [# grps] and individual observations [# obs])
	observed during combined avian use surveys and incidental observations at the
	Campbell County Wind Farm 2 Project in Campbell County, South Dakota, from
	June 21, 2020 – May 19, 2021, and March 26, 2023 – February 19, 2024.

			Surveys		Incidental		Total	
Species	Scientific Name	Status ¹	# grps	# obs	# grps	# obs	# grps	# obs
peregrine falcon	Falco peregrinus	ST; SGCN	1	1	0	0	1	1
northern harrier	Circus hudsonius	BCC	14	14	0	0	14	14
Large Birds Overall	7 species		22	59	3	4	25	63
bobolink	Dolichonyx oryzivorus	BCC	2	2	0	0	2	2
grasshopper sparrow	Ammodramus savannarum	BCC	4	4	0	0	4	4
red-headed woodpecker	Melanerpes erythrocephalus	BCC	3	3	1	1	4	4
Small Birds Overall	3 species		9	9	1	1	10	10

¹ ST = State Threatened; SGCN = Species of Greatest Conservation Need (South Dakota Department of Game, Fish and Parks 2014, 2018, 2023a); BGEPA = Bald and Golden Eagle Protection Act (1940); BCC = Birds of Conservation Concern (US Fish and Wildlife Service 2021a)

3.2 Raptor Nest Surveys

Raptor nest surveys were conducted in the spring of 2021 (Piorkowski 2023; Appendix E) and 2023 (Piorkowski and Wilson 2023; Appendix F). The objective of the nest surveys was to gather information on eagle nest locations and information on other raptor species nesting in the area. Surveys were conducted within the Project Area and a 2.0-mile buffer (Survey Area) for all raptors. Pre-flight planning included a desktop review of aerial imagery, national land cover data, and topographic data to develop a survey route, and to identify potential eagle and other raptor nesting habitats with the Survey Area. Potential nesting habitats for eagles and other raptors included riparian corridors, woodlands, large trees, and anthropogenic structures such as power poles. A biologist conducted the surveys in a helicopter operated by a pilot experienced in conducting low-altitude wildlife surveys. Surveys were generally conducted on days with good visibility and no precipitation. The locations of all raptor nests and survey paths were recorded using a hand-held onboard Global Positioning System (GPS) receiver.

For all raptor and eagle nest structures detected, the biologist recorded nest location coordinates with the GPS receiver, species present (if any), condition of the nest, presence of eggs or young (if present and visible), and the substrate of the nest (e.g., tree, power pole, rock outcrop). The status of each nest was determined as either: Occupied—an adult in incubating position, eggs, nestlings or fledglings, a newly constructed or refurbished stick nest and/or the presence of one or more adults on or immediately adjacent to the nest structure(s); or Unoccupied—a nest with no evidence of recent use, or attendance by adult raptors. Efforts were made to minimize disturbance to nesting raptors, livestock, or occupied dwellings to the greatest extent possible. Photographs were taken of possible eagle nests.

3.2.1 2021 Surveys

Raptor nest surveys were conducted from March 29 - 31, 2021, and May 10 - 11, 2021. One historic bald eagle nest, EN-2, could not be relocated during 2021 surveys. An occupied and active bald eagle nest (EN-3), first observed by WEST in 2021, was located 628.0 feet (191.4 m) to the northeast of EN-2. One nestling was observed in EN-3 in May 2021.

Twenty-one non-eagle raptor nests were documented within the Project Area, including 12 historic nests located during previous surveys (Figure 3.2, Table 3.2; Piorkowski 2023). Twenty historic non-eagle raptor nests could not be located (Table 3.2). Five historic non-eagle nests were occupied and active; seven historic nests were unoccupied and inactive. Ten nests were observed for the first time in 2021: one in the Project Area and nine in the Survey Area (Figure 3.2).

3.2.2 2023 Surveys

Raptor nest surveys were completed between March 12 – July 8, 2023. Two historical bald eagle nests (EN-2 and EN-3) in the Survey Area were identified during previous surveys (Piorkowski 2021a); EN-2 could not be located, as was the case in 2021 raptor nest surveys (Table 3.3, Figure 3.2). Nest EN-3, first located in 2021, was located and was classified as occupied and active by a bald eagle pair. No other large- or giant-sized stick nests were observed during surveys.

Two non-eagle raptor nests were identified in the Project Area (RN-72 and RN-73) and five were identified in the Survey Area (RN-70, RN-71, RN-74, RN-75, and RN-76; Table 3.3, Figure 3.2).

3.3 Prairie Grouse Lek Surveys

The Project Area occurs within the range of the prairie grouse. Greater prairie-chicken is listed as a SGCN in South Dakota. In 2021, WEST conducted surveys to document prairie grouse leks during the breeding season within the Project Area and a 2.0-mile buffer (Piorkowski and Agudelo 2021a; Figure 3.3). In 2023, WEST conducted surveys within the 2023 Project Area and within the MCP of the 2023 Project Area (Piorkowski and Gerringer 2023; Figure 3.3) The objective of the prairie grouse lek surveys was to identify potential leks (two or more males in courtship display) and determine the status of each lek to inform Project development decisions. These surveys were conducted in 2021 (Appendix G) and 2023 (Appendix H).

3.3.1 2021 and 2023 Surveys

Lek surveys were conducted from April 4 – 29, 2021, and March 27 – May 2, 2023. Four potential leks were observed during 2021 (Figure 3.3, Table 3.4) and resurveyed in 2023 (Table 3.4, Figure 3.3). One lek was active during both years of survey (Lek ID 2). All identified leks were observed outside of the Project Area except for Lek ID 1 (Table 3.4).



Figure 3.2. Location of raptor nests identified during surveys in 2021 and 2023 for the Campbell County Wind Farm 2 Project in Campbell County, South Dakota.



Figure 3.3. Location of prairie grouse leks within the Project and Survey Areas at the Campbell County Wind Farm 2 Project in Campbell County, South Dakota.

Nest ID	Species	Nest Status	Nest Substrate	Nest Size
EN-2 ¹	Bald eagle	Did not locate	Deciduous tree	Unknown
EN-3 ¹	Bald eagle	Occupied/Active	Deciduous tree	Giant
RN-2 ¹	Red-tailed hawk	Occupied/Active	Deciduous tree	Medium
RN-16 ¹	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-17 ¹	Red-tailed hawk	Occupied/Active	Deciduous tree	Medium
RN-18 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-19 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-201	Unidentified raptor	Did not locate	Unknown	Unknown
RN-221	Red-tailed hawk	Occupied/Active	Deciduous tree	Medium
RN-231	Red-tailed hawk	Occupied/Active	Deciduous tree	Medium
RN-24 ¹	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-25 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-26 ¹	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-27 ¹	Unidentified Buteo	Did not locate	Deciduous tree	Unknown
RN-28 ¹	Unidentified raptor	Unoccupied/Inactive	Unknown	Medium
RN-29 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-30 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-31 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-32¹	Unidentified raptor	Occupied/Active	Deciduous tree	Medium
RN-33 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-34 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-35 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-36 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-37 ¹	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-38 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-39 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-40 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-41 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-42 ¹	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-43 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-52 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-53 ¹	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-54 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-55 ¹	Unidentified raptor	Did not locate	Unknown	Unknown
RN-56	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-57	Red-tailed hawk	Occupied/Active	Deciduous tree	Medium
RN-58	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-59	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-60	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-61	Red-tailed hawk	Occupied/Inactive	Deciduous tree	Medium
RN-62	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-63	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-64	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium

 Table 3.2. Raptor nests identified during 2021 raptor nest surveys at Campbell County Wind

 Farm 2 Project in Campbell County, South Dakota.

^{1.} Historic nest.

 Table 3.3.
 Raptor nests identified during 2023 raptor nest surveys at Campbell County Wind

 Farm 2 Project in Campbell County, South Dakota.

Nest ID	Species	Nest Status	Nest Substrate	Nest Size
EN-2 ¹	Bald eagle	Did not locate	Unknown	Unknown
EN-31	Bald eagle	Occupied/Active	Deciduous tree	Giant

Nest ID	Species	Nest Status	Nest Substrate	Nest Size
RN-70	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-71	Great horned owl	Occupied/Active	Deciduous tree	Medium
RN-72	Great horned owl	Occupied/Active	Deciduous tree	Small
RN-73	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Small
RN-74	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-75	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Medium
RN-76	Unidentified raptor	Unoccupied/Inactive	Deciduous tree	Small

 Table 3.3. Raptor nests identified during 2023 raptor nest surveys at Campbell County Wind

 Farm 2 Project in Campbell County, South Dakota.

^{1.} Historic nest.

Table 3.4.Maximum count and activity status of prairie grouse surveyed during 2021 and 2023 lek
surveys conducted at the Campbell County Wind Farm 2 Project in Campbell County,
South Dakota.

	2021			2023		
	Maximum Number of			Maximum Number of		
Lek ID	Species	Grouse	Status	Species	Grouse	Status
1*	STGR	12	Active	_	0	Inactive
2	STGR	13	Active	STGR	3	Active
3	UNKN	7	Active	-	0	Inactive
4	STGR	7	Active	—	0	Inactive

* Located within the Project Area.

Species include STGR = sharp-tailed grouse; UNKN = Unknown.

3.4 Prairie Dog Colony Surveys

Black-tailed prairie dog (*Cynomys ludovicianus;* prairie dog) colony desktop review and field surveys for the Project Area and a surrounding 2.0-mile area were conducted in April 2021 (Appendix I). The primary objective of the prairie dog colony mapping was to identify prairie dog colonies that may attract raptor species, including eagles or other SOC (e.g., swift fox [*Vulpes velox*]) to the Project Area. The USFWS Region 6 recommends applying a 500-meter (1,640-ft) buffer to any prairie dog colonies from wind turbines (USFWS 2021b).

A desktop review of recent USDA National Agriculture Imagery Program (2020) aerial imagery was proceeded by field surveys concurrent with aerial prairie grouse lek surveys (Piorkowski and Agudelo 2021a). Two aerial surveys were conducted by flying 0.25-mile (0.40-km) spaced transects in a fixed-wing aircraft (Piorkowski and Agudelo 2021a) with two observers during daylight hours. Desktop review of aerial imagery and field surveys did not identify any prairie dog colonies within the Survey Area.

3.5 Bat Acoustic Surveys

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) conducted acoustic monitoring studies in 2019 and 2020 to assess the seasonal and spatial bat activity within the Project Area in accordance with recommendations in the WEG (Burns & McDonnell 2020; Appendix J).

Two acoustic detectors were deployed at two locations from August 5 – October 23, 2019, and April 17 – June 25, 2020. Both acoustic units were elevated 6.5 feet (2.0 m) from the ground. For each survey location, bat passes (i.e., at least two individual calls within one second) were sorted into two groups based on the call's minimum frequency. High-frequency (HF) bats, such as eastern red bats (*Lasiurus borealis*) and *Myotis* species (including NLEB) have minimum frequencies greater than 30 kilohertz (kHz). Low-frequency (LF) bats, such as big brown bats (*Eptesicus fuscus*), silver-haired bats (*Lasionycteris noctivagans*), and hoary bats (*Lasiurus cinereus*), typically emit echolocation calls with minimum frequencies below 30 kHz.

The detectors operated for 264 detector-nights, resulting in 5,322 bat passes. Most passes were from HF species (52%), while LF species made up 48% of passes. Bat activity was higher in fall than spring with higher activity recorded along the riparian and treed habitat. Analysis focused on bat activity and not specifically species composition.

3.6 Northern Long-eared Bat Presence/Absence Surveys

Based on the results of the NLEB suitable habitat assessment (Section 2.1.4) and recommended USFWS guidance following the 2023 Range-Wide Indiana Bat & Northern Long-eared Bat Survey Guidelines, a study plan was provided to USFWS to conduct mist-netting surveys for NLEB following these guidelines. With only 27 acres of potential habitat the study plan included mist-netting efforts at once location within the Project area. On July 28, 2023, USFWS provided written authorization with the recommendation to complete surveys at two locations exceeding the 2023 survey guidelines.

Mist-netting was conducted at two locations and included a minimum of three non-consecutive nights at each location. Ten mist-net nights were completed at each location resulting in the capture of 11 bats: five eastern red bats (*Lasiurus borealis*), four hoary bats (*L. cinereus*), and two big brown bats (*Eptesicus fuscus*). No NLEB were captured during this survey effort. Based on these results and following the 2023 survey guidelines, NLEB were presumed absent.

4 POTENTIAL IMPACTS TO WILDLIFE

Impacts to wildlife from construction and operation of a wind energy facility (WEF) can be *direct* or *indirect*. *Direct* impacts result from interactions with facility infrastructure during operations, such as collisions with turbines or buildings or interactions with power lines. *Indirect* impacts can occur during construction, operation, and decommissioning of a facility and can be difficult to predict, especially at locations where they have not been studied. Displacement is the main potential indirect impact from wind energy development on wildlife; barrier effects (i.e., effects that impede movement) are another potential indirect impact. Habitat loss, fragmentation, or alteration are all examples of potential direct or indirect impacts from wind energy development that could occur during construction and/or operations.

This section focuses on impacts that are most likely to occur at the Project, particularly collisions with turbines, avian power line interactions, and displacement, which were determined from results of Tier 1 (preliminary site evaluation), Tier 2 (site characterization), and Tier 3 (field studies) studies (USFWS 2012), and WEST's experience with WEF in the Project's region and the US. These impacts will be described for all birds, diurnal raptors, and bats along with avian and bat SOC observed at the Project. These potential impacts may be reduced through avoidance and minimization measures (Section 5).

4.1 Methods

Assessment of potential impacts to wildlife species at the Project was informed by Tier 1–3 studies conducted for the Project along with the most up-to-date publicly available information on impacts to wildlife from wind energy. Tier 1–3 studies provided information on 1) the likelihood of SOC occurring at the Project, 2) actual occurrence of SOC observed across all studies relevant to the Project, and 3) spatial and temporal patterns of species occurrences at the Project. Project-specific information was contextualized by including publicly available information at multiple spatial scales on 1) avian and bat fatality estimates due to turbine collisions, 2) species composition of turbine-related fatalities of avian and bat SOC, and 3) temporal patterns of avian and bat fatalities. In addition, factors influencing potential avian power line interactions and potential indirect impacts for birds and bats were discussed in the context of the Project. For non-avian species a review of current literature was undertaken to provide additional context for potential impacts.

Analysis of direct impacts to birds and bats resulting from collision with wind turbines for this WCS relies on WEST's Renew database (WEST 2023) that contains public results of post-construction fatality monitoring studies for birds and bats from across the US. Fatality estimates for birds (all birds, diurnal raptors) and bats were summarized at multiple spatial scales (e.g., state, BCR, USFWS Region, USEPA Ecoregions, and US) to provide a landscape-scale context. For this Project, landscape scales corresponded to South Dakota, Prairies Potholes BCR 11, USFWS Mountain-Prairie Region (Region 6—North and South Dakota, Nebraska, Kansas, Montana, Wyoming, Colorado, Utah), USEPA Level I Ecoregion (9, Great Plains), and the lower 48 states of the US (Figure 4.1).

Fatality studies were screened to provide "comparable" information across WEFs by including annual fatality estimates that 1) were calculated from turbines greater than 0.5 MW; 2) were calculated from the Huso, Shoenfeld, or GenEst estimators; 3) covered adequate sampling time for taxa of interest when most fatalities have been observed (i.e., two seasons for bats, three seasons for birds); and 4) were averaged for each WEF when multiple fatality studies were conducted at a facility.


Figure 4.1. Spatial scales (Bird Conservation Region 11, US Fish and Wildlife Service Mountain-Prairie Region, US Environmental Protection Agency Level I Ecoregion [Great Plains]) examined for avian and bat impacts relative to the Campbell County Wind Farm 2 Project in Campbell County, South Dakota.

4.2 Birds

Impacts to birds include both direct (collisions) and indirect (avoidance or displacement). Direct impacts to birds from land based WEFs have been documented in the US since the late 1980s (Orloff and Flannery 1992) and 368 species of birds have been recorded as fatalities at WEFs in the US (WEST 2023). Given continued concern over bird species' vulnerability to collision fatalities at WEFs (Thaxter et al. 2017, American Wind Wildlife Institution [AWWI] 2019), understanding the magnitude of these impacts at multiple spatial scales is critical for management of SOC. Indirect impacts have been measured in terms of avoidance or displacement of different bird species and bird groups (Leddy et al. 1999, Loesch et al. 2013, Shaffer and Buhl 2016, Pearse et al. 2021).

4.2.1 Fatality Estimates

4.2.1.1 All Birds

WEST compiled data from 617 studies across 372 WEF in the US that have reported 368 species of birds as fatalities (WEST 2023). Across all spatial scales examined in this report, fatality estimated ranged from zero to 10.56 fatalities/MW/year; median and mean estimates ranged from 1.49 to 3.54 (median) to 2.22 to 4.37 (mean) across all spatial scales (Table 4.1). Fatality estimates from scales with low sample sizes should be interpreted with caution.

	Fatality	estimates (I				
Spatial Scale	Min	Max	Median	Mean	Facilities ²	Studies ³
South Dakota	0.41	4.57	1.69	2.22	3	6
Prairie Pothole BCR	1.02	10.56	3.54	4.37	17	23
Great Plains	0.08	10.56	2.93	3.42	53	67
USFWS Mountain-Prairie Region	0.41	5.95	1.49	2.23	13	20
US	0	10.56	2.68	3.00	121	176

Table 4.1.	Summary of fatality	estimates for all bi	rds from multiple sp	atial scales in the US. ¹
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^{1.} Data on fatality rates from the Renew database (Western EcoSystems Technology, Inc. 2023).

^{2.} Facilities are individual wind projects.

^{3.} Multiple studies may occur at a given facility in different years.

BCR = Bird Conservation Region; USFWS = US Fish and Wildlife Service.

4.2.1.2 Diurnal Raptors

WEST reviewed fatality estimates for raptors at multiple spatial scales, similar to all birds (above). Overall fatality estimates ranged from 0 to 0.77 fatalities/MW/year; median and mean estimates ranged from 0.03 to 0.08 (median) to 0.05 to 0.10 (mean) across all spatial scales (Table 4.2). Fatality estimates from scales with low sample sizes should be interpreted with caution.

Table 4.2.	Summary of fatality estimates for diurnal raptors from multiple spatial scales in the US. ¹
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	Fatality	estimates (-		
Spatial Scale	Min	Max	Median	Mean	Facilities ²	Studies ³
South Dakota	0.06	0.10	0.08	0.08	2	4
Prairie Pothole BCR	0	0.19	0.03	0.05	8	11
Great Plains	0	0.46	0.04	0.08	31	37
USFWS Mountain-Prairie Region	0.04	0.18	0.07	0.09	6	10
US	0	0.77	0.06	0.10	68	91

^{1.} Data on fatality rates from the Renew database (Western EcoSystems Technology, Inc. 2023).

^{2.} Facilities are individual wind projects.

^{3.} Multiple studies may occur at a given facility in different years.

BCR = Bird Conservation Region; USFWS = US Fish and Wildlife Service.

4.2.2 Species Composition

4.2.2.1 All Birds

One hundred forty-three of the approximately 450 avian species from the USFWS Mountain-Prairie Region were recorded as fatalities with the top five species including horned lark, (*Eremophila alpestris*) ring-necked pheasant (*Phasianus colchicus*), mallard (*Anas platyrhynchos*), golden eagle, and western meadowlark (*Sturnella neglecta*; WEST 2023).

4.2.2.2 Diurnal Raptors

The top five raptor species found as fatalities in the USFWS Mountain-Prairie Region were golden eagle, red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), bald eagle, and Swainson's hawk (*B. swainsoni*; WEST 2023).

4.2.2.3 <u>Temporal Patterns of Fatalities</u>

Temporal patterns at multiple spatial scales show peak bird fatalities during spring and/or fall migration seasons, particularly for passerines (Figure 4.2) and are particularly evident at spatial scales with larger sample sizes (i.e., Great Plains, US). Fatality patterns from scales with low sample sizes should be interpreted with caution.

4.2.2.4 Species of Concern

Eleven avian SOC were recorded during studies conducted for the Project and of these, all have been recorded as fatalities at WEFs at one of the spatial scales of interest in the US (Table 4.3). Two raptor SOC, bald and golden eagle, were observed at the Project incidentally (i.e., outside of standardized surveys) and is in the top five species of raptor fatalities in the USFWS Mountain-Prairie Region (WEST 2023). Two of the 11 SOC (American white pelican and grasshopper sparrow) observed at the Project during Tier 3 baseline surveys (Section 3), have been recorded as fatalities in South Dakota (Table 4.3).

Note the raw fatality counts shown in Table 4.3 do not account for differences in detectability (e.g., large birds are more easily detected than small birds) nor differences in study design (e.g., many post-construction fatality monitoring studies are designed to find eagles). The information in Table 4.3, therefore, should be interpreted with caution. The intent of this table is to determine if SOC have been recorded as fatalities at multiple spatial scales and to provide a basis for predicting if they may also be expected as fatalities at a project.





Species	Scientific name	South Dakota	BCR 11	Great Plains	USFWS Mt-Prairie Region	US
American white pelican	Pelecanus erythrorhynchos	4	27	37	4	45
bald eagle	Haliaeetus leucocephalus	0	1	7	12	58
bobolink	Dolichonyx oryzivorus	0	1	3	0	21
ferruginous hawk	Buteo regalis	0	0	15	7	38
Franklin's gull	Leucophaeus pipixcan	0	0	1	0	1
golden eagle	Aquila chrysaetos	0	0	22	50	157
grasshopper sparrow	Ammodramus savannarum	3	6	25	9	32
northern harrier	Circus hudsonius	0	1	5	3	28
peregrine falcon	Falco peregrinus	0	0	3	0	9
red-headed woodpecker	Melanerpes erythrocephalus	0	2	4	2	6

Table 4.3.	Avian species of concern observed at the Campbell County Wind Farm 2 Project in
	Campbell County, South Dakota, and total number of fatalities recorded at multiple
	spatial scales in the US. ¹

^{1.} Data represent unadjusted fatality counts and inform the potential species composition of fatalities that may occur at the Project. Data from the Renew database (Western EcoSystems Technology, Inc. 2023).

BCR = Bird Conservation Region; USFWS = US Fish and Wildlife Service

4.2.3 Direct Impacts: Avian Power Line Interactions

Potential impacts to birds from power line operation include electrocution and collision risks, which depend on line location, voltage, and configurations relative to area habitats and bird presence/use. For the Project, the 34.5-kilovolt collector lines from the wind turbines to the Project's substation will be buried. Additionally, up to 700.0 feet (213.4 m) of transmission line will be designed and constructed for the Project. These above ground lines will meet all APLIC suggested practices (APLIC 2006 and 2012, respectively).

4.2.4 Indirect Impacts

Construction of the Project will result in habitat impacts that could lead to avoidance or displacement of local avian species. Displacement effects, defined as "the displacement of birds from areas within and surrounding wind farms due to visual intrusion and disturbance that can amount effectively to habitat loss," are a primary indirect impact at WEFs (Drewitt and Langston 2006). Displacement may occur during both construction and operation of a wind project and may be caused by the presence of turbines and/or ongoing site activities such as vehicle and personnel movements or site maintenance.

The scale and degree of displacement effects varies according to site and species-specific factors. The scale of disturbance caused by WEFs varies greatly and is likely to depend on multiple factors including seasonal and daily patterns of use by birds, location to important habitats, availability of alternative habitats, and turbine and wind project specifications (Drewitt and Langston 2006, Lange et al. 2018). Similarly, the degree of behavioral responses will vary among species and individuals and may depend on factors such as life cycle stage (e.g., wintering, molting, breeding), flock size, and degree of habituation. Research indicated that indirect impacts of wind turbines on grassland nesting birds from displacement vary across years, species, sites, and distance from turbines (Erickson et al. 2004, Young et al. 2006, Shaffer and

Johnson 2009, Hale et al. 2014, Hale 2016, Johnson 2016, Shaffer and Buhl 2016). AWWI (2017) concluded that indirect impacts on birds from operating wind turbines due to displacement result in some species showing consistent decreases in abundance while other species show no effect. Other bird groups have also indicated potential displacement from habitat in proximity to wind turbines such as waterfowl (Loesch et al. 2013) and synthesized in Marques et al. (2021).

4.2.5 Summary

Multi-scale summaries of bird fatality information from South Dakota, Prairie Pothole BCR, USFWS Mountain–Prairie Region, Great Plains, and the US provide insight into the number, species composition, and timing of fatalities that could be expected at the Project. Attempts were made to standardize comparisons in this report (see Section 4.1) but many factors including study design, study implementation, data analysis, and availability of public information all influence the quality of these summaries. Information from Tier 1–3 studies conducted at the Project also provide information on factors that may influence the likelihood of avian fatalities at the Project including species composition and spatial and temporal movement patterns (Watson et al. 2018, AWWI 2019), which can be applied to project planning to minimize fatalities.

Taking into account information from Tier 1–3 studies and publicly available information on bird fatalities at WEFs, the range of bird fatality estimates observed in the USFWS Mountain–Prairie Region and Great Plains may be expected to encompass the impacts anticipated at the Project. Similarly, the species composition observed in the USFWS Mountain–Prairie's Region may resemble that anticipated at the Project. Lastly, the timing of fatalities for birds in the USFWS Mountain-Prairie Region may be expected to encompass the timing of fatalities at the Project. Indirect impacts may influence avian species at varying degrees based on the synthesis of previous research Marques et al. (2021). In all these predictions, however, there is some uncertainty because of the limited number of studies and facilities with publicly available data in South Dakota.

4.3 Bats

Impacts to bats from the construction and operation of the Project could include both direct and indirect impacts. Potential direct impacts to bats (i.e., all bats, bat SOC) are described below.

4.3.1 Direct Impacts

4.3.1.1 Fatality Estimates

Thirty-one species of bats were recorded as fatalities at WEFs in the US (WEST 2023). Across all spatial scales examined in this report, fatality estimates for all bats ranged from 0 to 41.44 fatalities/MW/year, while median and mean estimates ranged from 0.93 to 7.86 (median) to 0.87 to 9.41 (mean) across all spatial scales (Table 4.4). Fatality estimates from scales with low sample sizes should be interpreted with caution.

	Fatality	estimates (
Spatial Scale	Min	Мах	Median	Mean	Facilities ²	Studies ³
South Dakota	0.74	0.94	0.93	0.87	3	6
Great Plains	0.11	41.44	7.86	9.41	59	75
USFWS Mountain-Prairie Region	0.42	12.72	1.16	2.74	13	20
US	0	41.44	3.57	7.42	153	234

Table 4.4.	Summary of fatality	estimates for bats fro	om multiple spatial s	scales in the US. ¹
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^{1.} Data on fatality rates from the Renew database (Western EcoSystems Technology, Inc. 2023).

^{2.} Facilities are individual wind projects.

^{3.} Multiple studies may occur at a given facility in different years.

BCR = Bird Conservation Region; USFWS = US Fish and Wildlife Service.

4.3.1.2 Species Composition

Ten of 26 species of bats in the USFWS Mountain–Prairie Region have been recorded as fatalities at WEFs with the top five species including hoary bat (53%), silver-haired bat (17%), eastern red bat (14%), Mexican free-tailed bat (*Tadarida brasiliensis*; 7%), and little brown bat (3%; WEST 2023).

4.3.1.3 <u>Temporal Patterns of Fatalities</u>

Temporal patterns at multiple spatial scales show peak bat fatalities for migratory tree bats (i.e., hoary bat, silver-haired bat, eastern red bat) and all bats during late summer and fall migration seasons (Figure 4.3). This pattern is consistent with other studies that found most bat fatalities occur during the fall migration season (July through October) and most fatalities occur on nights with relatively low wind speeds (e.g., less than 20 feet [six m] per second; Arnett et al. 2008, 2013; Arnett and Baerwald 2013; WEST 2023).

4.3.1.4 Species of Concern

Four bat SOC have the potential to occur at the Project and all these species were recorded as fatalities at WEFs at one of the spatial scales of interest in the US (Table 4.5).

Table 4.5. Bat species of concern with the potential to occur at the Campbell County Wind Farm 2 Project in Campbell County, South Dakota, and total number of fatalities recorded at multiple spatial scales in the US.¹

		South	USFWS Mt-		
Species	Scientific name	Dakota	Prairie Region	Great Plains	US
eastern red bat	Lasiurus borealis	21	168	2,465	14,907
hoary bat	Lasiurus cinereus	45	618	2,729	11,562
northern long-eared bat	Myotis septentrionalis	0	0	0	36
tricolored bat	Perimyotis subflavus	0	3	53	752

^{1.} Fatality data from publicly available information.

USFWS = US Fish and Wildlife Service



Figure 4.3. Fatalities of bat species at multiple spatial scales in the US (Western EcoSystems Technology, Inc. 2023).

4.3.2 Indirect Impacts

Understanding how wind energy development could affect bats through indirect effects such as disturbance or displacement is limited by the lack of knowledge on this topic (Kunz et al. 2007, AWWI 2018). Based on a NLEB habitat assessment, there was limited NLEB summer roosting habitat within the Project Area (27 acres; Piorkowski 2021b, USFWS 2023c). These identified areas were avoided by at least 0.5 mile, minimizing potential impacts. It is not anticipated that operation of the Project would permanently displace bats based on pre- and post-construction studies of bat activity conducted at WEFs that show increased activity following construction (Solick et al. 2020). Furthermore, some studies documented increased activity following construction due to attraction to turbines (Cryan et al. 2014, Richardson et al. 2021).

4.3.3 Summary

Summaries of bat fatalities that occurred in South Dakota, the USFWS Mountain-Prairie Region, Great Plains, and the US provide insight into the number, species composition, and timing of fatalities that may be expected at the Project. Information from Tier 1–3 studies also provide information on factors that may influence the likelihood of fatalities at the Project.

Taking into account information from Tier 1–3 studies and publicly available information on bat fatalities at WEFs, the range of bat fatality estimates observed in the USFWS Mountain–Prairie Region and Great Plains Ecoregion may be expected to encompass the impacts anticipated at the Project. Similarly, the species composition observed in the USFWS Mountain–Prairie Region may resemble that anticipated at the Project and hoary bat, silver-haired bat, and eastern red bat are expected to comprise most fatalities. Lastly, the timing of fatalities for migratory tree bats in the USFWS Mountain–Prairie Region may be expected to encompass the timing of fatalities at the Project. In all these predictions, however, there is some uncertainty because of the limited number of studies and facilities with publicly available data in South Dakota.

4.4 Other Wildlife

Impacts to other wildlife from the construction and operation of the Project could include both direct and indirect impacts. For this WCS, a focus on non-bird and bat SOC and prairie grouse (species of management concern) is included. Potential direct and indirect impacts to other wildlife are described below.

4.4.1 Summary of Potential Impacts

4.4.1.1 Black-tailed Prairie Dog

Black-tailed prairie dogs are primarily located in the western and central regions of South Dakota in short and mixed-grass prairies (SDGFD 2014). Direct impacts are likely associated to permanent habitat loss such as roads and infrastructure development. No prairie dog colonies were identified during surveys (Section 3.4), and therefore no impacts to this species are anticipated.

4.4.1.2 Swift Fox

There is little information on the direct or indirect impacts of wind energy development on swift fox. Swift fox are often associated with prairie dog or ground squirrel colonies (SDGFD 2014) for both prey and denning resources. Increases in wind energy development has created a need to further understand the interactions between energy development and potential swift fox impacts (Wyoming Game and Fish Department 2017). As there are no prairie dog colonies identified within the Project area, the likelihood of impacts to swift fox are low.

4.4.1.3 Prairie Grouse

Twelve STGR fatalities have been documented at WEF's in the US with three of them being documented in South Dakota (WEST 2023). These fatalities are likely not associated with collisions from turbine blades or towers (Lloyd et al. 2022), as prairie grouse are more likely to collide with fences and powerlines (Stevens et al. 2012, Robinson et al. 2016). Permanent habitat loss from constructed roads and infrastructure can also result in direct impacts. Additionally, the construction and operations of a WEF may cause indirect impacts through avoidance of otherwise suitable habitat or changes in behavior, survival, and/or increase in predator presence (Hebblewhite 2011, Lloyd et al. 2022). To help address potential impact to prairie grouse, SDGFP developed Priority Habitat Categories and avoidance mitigation recommendations for development (SDGFP 2023).

Based on survey results (Sections 2.1.2 and 3.3), all turbine locations avoided the Tier 1 Priority Habitat Category and avoided leks by at least one mile as recommended by SDGFP. Conservation measures shall be executed to further minimize potential disturbance to STGR (Section 5.1 and 5.2). By carrying out these conservation measures, the likelihood of impacts to STGR are low.

5 AVOIDANCE AND MINIMIZATION MEASURES

Information gathered during Tier 1, 2, and 3 studies will be used during the Project design and turbine and infrastructure siting process to reduce potential impacts to birds and bats and their habitats. As part of the NEPA process and Section 7 Consultation with USFWS for approval of the WAPA interconnection, the Project will implement the applicable best management practices and mitigation measures specified in the UGP PEIS developed jointly by WAPA and USFWS (2015). This PEIS included species-specific avoidance and minimization measures provided in Consistency Evaluation Forms (CEF) that were completed by Campbell County 2 (Appendix K). Campbell County 2 is committed to avoiding and/or minimizing impacts to wildlife through Project design, construction, and operation by implementing the following Conservation Measures. The following Conservation Measures represent Campbell County 2's willingness to ensure the least harm to avian and bat species.

5.1 Conservation Measures Implemented During Site Selection and Project Design

Campbell County 2 will make efforts during initial site selection and during Project design to locate and select wind turbines, meteorological (MET) towers, and other infrastructure such that impacts

to birds and bats or their habitats are minimized. Project design and siting measures to avoid or minimize impacts to avian and bat species will include the following:

- Power generation per turbine will be maximized to reduce the number of turbines needed to achieve maximum energy production, to the extent commercially reasonable.
- MET towers will not be located in sensitive habitat (e.g., wetlands or unbroken grasslands) and construction of these MET towers will be scheduled to avoid breeding activities or other important behaviors, and the disturbed area will be minimized.
- No guy wires will be used at the Project.
- Bird flight diverters will be installed on the top static wire on any new or upgraded overhead collector, distribution, and transmission lines.
- Turbines siting will avoid wooded patches.
- Grasslands disturbance will be minimized and turbine siting will avoid unbroken grasslands.
- Avoid siting Project components in wetlands and waterbodies.
- Wind turbine buffer zones will be established around occupied raptor nests following USFWS Region 6 guidance (USFWS 2021b).
- No turbines will be sited within 2.0 miles of identified eagle nests.
- Avoid siting turbines within 0.5 mile of suitable NLEB foraging, roosting, and commuting habitat. Mist-netting survey results did not identify any NLEB occupancy at the Project (Sirajuddin and Piorkowski 2023) and is presumed absent.
- Avoid siting turbines at all Tier 1 sharp-tailed grouse habitat and minimize disturbance to Tier 2 and 3 sharp-tailed grouse habitat.
- Avoid disturbance within 1.0 mile of previously documented lek locations.

5.2 Conservation Measures to be Implemented during Construction

Construction of the Project is expected to begin in the third quarter of 2025 and continue 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 impacts to avian and bat species during construction:

- Vehicle speeds will be limited to 25 miles (40 km) per hour (mph) to avoid wildlife collisions and construction vehicles will be restricted to pre-designated access routes.
- To the extent feasible, the area required for Project construction and operation will be minimized. Campbell County 2 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.

- 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 will be included.
- A noxious weed control plan will be developed and implemented in accordance with the county regulations and land lease agreements.
- Water unpaved roads, disturbed areas (e.g., scraping, excavation, backfilling, grading, and compacting), and loose materials generated during Project activities as necessary to minimize fugitive dust generation.
- All turbine and MET tower lighting will follow Federal Aviation Administration requirements.
- Lighting at substations and other operations and maintenance facilities shall be kept at a minimum required for safety and security needs (e.g., directional, hooded and/or shielded, low-intensity, low-sodium lights equipped with motion sensors). Extinguish all internal turbine nacelle and tower lighting when unoccupied.
- No construction activities will occur within 1.0 mile of a prairie grouse lek from March 15 June 30. If a 1.0-mile avoidance buffer cannot be maintained, limit construction and disruptive activities from three hours after sunrise to one hour before sunset.
- Tree removal shall be minimized as much as feasible to reduce impacts to bat roosting habitat. Avoid tree removal from April 1 October 31 to reduce potential impacts to roosts and other tree roosting habitats for NLEBs and other bat species.
- Tree snags, dead/dying trees, and trees with exfoliating bark 3.0 inches (7.6 centimeters) or greater diameter at breast height shall be retained within 1.0 mile from water.
- Ground clearance surveys will be completed during the breeding season (May 1 August 30) within grasslands a maximum of one week prior to new construction activities to identify and mark any nests of breeding birds and will be valid for seven days from the survey date.
- Whooping crane monitoring within two miles of construction in both spring and fall migration seasons shall be conducted by a third-party monitor or by trained construction staff.
- All construction work within two miles of an observed whooping crane shall stop until the crane leaves. This follows the Project's whooping crane operational contingency plan.
- Gravel will be placed at least 5.0 feet (1.5 m) around each turbine foundation to discourage small mammals and reptiles from burrowing under or near turbine bases.
- Campbell County 2, or their designee, will provide training resources to all construction and site personnel on identification of SOC and their habitats to minimize and/or avoid disturbance.
- 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 pets will be allowed on the Project site during construction.
- All permanent MET towers will be un-guyed.

• All trash will be covered in containers and work sites will be cleared regularly of any garbage and debris related to food.

5.3 Conservation Measures to be Implemented during Operations

Operations of the Project is expected to begin by Quarter 4 2026 with an operational life of approximately 25–30 years. The following Conservation Measures will be implemented to avoid or minimize impacts to avian and bat species during operations:

- Vehicle speeds will be limited to 25 mph to avoid wildlife collisions.
- 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).
- A WCS as described in the WEG will be developed
- Pest and weed control measures will be implemented as specified by county, state, and federal requirements.
- Other than maintenance vehicles, which will park at the entrance of turbines for maintenance purposes, parts and equipment which may be used as cover for prey will not be stored at the base of wind turbines while a turbine is operational.
- A carcass removal program will be implemented to minimize potential attractants for carrion-feeding raptors.
- Turbines blades will be feathered to the manufacturer's cut in speed from sunset to sunrise when the temperature is above 40 degrees Fahrenheit (10 degrees Celsius) from July 15 – September 30
- Turbine curtailment of 16 feet (five m) per second will be conducted between August 16 October 31 during the fall bat migration season.
- Operational monitoring will be conducted during the whooping crane migration seasons (spring and fall); operations staff will be trained to identify whooping cranes, and if any are noted in the Project Area, turbines will be shut down within two miles of the crane observation until it leaves the Project Area and following the Project's whooping crane operational contingency plan.
- Following the UGP PEIS CEFs, 134 acres (54 ha) of wetlands will be mitigated within the South Dakota 50% whooping crane corridor or within the top five deciles (Niemuth et al. 2018) within the 95% whooping crane corridor in South Dakota prior to interconnection.
- One year of post-construction fatality monitoring will be completed to assess potential impacts at the level described in the Project Consistency Evaluation Form for NLEB and meeting a detection value of 0.2 using an Evidence of Absence evaluation approach.
- All of Campbell County 2'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 include:
 - Instruct employees, contractors, and site visitors to avoid harassment and disturbance of wildlife.

- Instruction on identification and values of plant and wildlife species (especially protected species) and significant natural plant community habitats and measures to minimize the spread of weeds.
- Include an overview of the distribution, general behavior, and ecology of golden and bald eagles and appropriate measures when an eagle is encountered.
- If any federally protected species fatality is found, Campbell County 2 will coordinate with the USFWS Ecological Services Field Office within 24 hours of confirmed identification.

6 TIER 4—POST-CONSTRUCTION AVIAN AND BAT MONITORING

6.1 Monitoring Goals

The goals of post-construction monitoring are to estimate bird and bat fatality rates for the Project, evaluate the circumstances under which fatalities occur, and evaluate the likelihood of NLEB fatalities as described in the Project's EA. Post-construction monitoring results could also provide triggers for adaptive management, described in Section 8. In accordance with the WEG and the EA (WAPA 2024), the Project will analyze bird and bat carcass monitoring data to accomplish the following:

- Provide a list of species fatalities at the site.
- Estimate bird and bat fatality rates for the Project.
- Estimate fatality rates for SOC using GenEst analysis software, as allowed by sample size.
- Compare estimated fatality rates to predicted fatality rates listed in the WCS.
- Evaluate bird and bat carcasses within the Project in relation to site characteristics.
- Compare estimated fatality rates at the Project to fatality rates at existing Projects in similar landscapes with similar species composition.
- Commit to one year of post-construction monitoring that achieves a minimum *g*-value (detection probability) of 0.2 for NLEB and uses Evidence of Absence to analyze fatality estimates.
- Assess if adaptive management may be needed.

For long-term fatality monitoring, Operations and Maintenance staff will be specifically trained to monitor for dead or injured golden eagles, bald eagles, and other SOC species during their work activities. A data sheet that describes how Project personnel can recognize an injured or dead eagle or sensitive species will be posted in the maintenance facility. The data sheet will include instructions and the procedures that personnel shall take in the event an injured or dead golden eagle, bald eagle, or other protected species is discovered onsite, including whom to notify and what actions shall be taken. Any incident involving a state or federally listed threatened or endangered species, or a golden or bald eagle will be reported to the USFWS and the SDGFP within 24 hours of identification.

7 TIER 5—OTHER POST-CONSTRUCTION STUDIES

At the time of this WCS, no additional post-construction activities are anticipated. If during the life of the Project and in discussion with USFWS or SDGFP additional studies are warranted, appropriate study plans or protocols can be developed and included within the WCS.

8 ADAPTIVE MANAGEMENT

In 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 goals of the adaptive management approach are to enable the incorporation of results from the post-construction fatality monitoring, Operation's long-term monitoring and reporting, industry research, and new regulatory developments into the Project's wildlife avoidance and minimization strategy. If the avoidance and minimization measures are not producing the desired results, adjustments will be made, as necessary, to reduce impacts to wildlife. Campbell County 2 will report and coordinate with the USFWS and SDGFP as necessary and appropriate to address any unanticipated issues. If appropriate, Campbell County 2 will conduct additional targeted monitoring to determine if adaptive management measures are necessary and/or effective.

Project siting, influenced by adaptively responding to pre-construction survey results and following wildlife agency guidance and recommendations to the extent feasible, has attempted to avoid or minimize impacts to wildlife within the surveyed Project Area (Sections 2 and 3). Based on these avoidance and minimization measures (Section 5) and conditions described in the draft EA (WAPA 2024), no significant adverse impacts are anticipated at this time from the Project and avian and bat fatalities are expected to fall within the range of other similar projects in similar regions (Section 4). However, situations for considering an adaptive management response may include fatality of an eagle or a species federally or state-listed as endangered or threatened.

In this situation, an assessment of why this occurred will be conducted to aid in developing an appropriate response. Some of the adaptive management options that could be considered, and taking into account economic feasibility,² include:

- Additional post-construction studies
- Additional on-site studies (e.g., prey base studies)
- Addition or modification of anti-perching, anti-nesting, or electrocution protection devices, if deemed warranted
- Smart curtailment options for turbines

² Once the Project is operational there is a fixed amount of capital expenditure and the only available source of funding is from operational budgets, which must be within the economic parameters of the Project.

9 KEY RESOURCES

Resource	Phone Number
US Fish and Wildlife Service, Region 6	202 226 8171
Migratory Bird Office, Denver, Colorado	303-230-6171
South Dakota Game, Fish, and Parks	605 222 7660
Pierre, South Dakota	005-225-7000
Operations and Maintenance	TRD
Campbell County Wind Farm 2, LLC	שמו

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10.2 Acts, Rules, and Regulations

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- 16 United States Code (USC) § 668c. 1940. Title 16 Conservation; Chapter 5a Protection and Conservation of Wildlife; Subchapter II - Protection of Bald and Golden Eagles; Section (§) 668c -Definitions. 16 USC 668c. [June 8, 1940, Chapter (Ch.) 278, Section (§) 4, 54 Statute (Stat.) 251; Public Law (PL) 92-535, § 4, October 23, 1972, 86 Stat. 1065.]. Available online: <u>https:// www.gpo.gov/fdsys/pkg/USCODE-2010-title16/pdf/USCODE-2010-title16-chap5A-subchapII.pdf</u>
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- 50 Code of Federal Regulations (CFR) § 10.12. 1973. Title 50 Wildlife and Fisheries; Chapter I -United States Fish and Wildlife Service, Department of the Interior; Subchapter B Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 10 General Provisions; Subpart B Definitions; Section (§) 10.12. Definitions. 50 CFR 10.12. [38 Federal Register (FR) 22015, August 15, 1973, as amended at 42 FR 32377, June 24, 1977; 42 FR 59358, November 16, 1977; 45 FR 56673, August 25, 1980; 50 FR 52889, December 26, 1985; 72 FR 48445, August 23, 2007.].

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Appendix A. Campbell County Wind Farm 2 Project, Biological Assessment—Report

Appendix B. US Fish and Wildlife Service Information for Planning and Consultation Query for Listed and Sensitive Resources for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota Appendix C. Campbell County Wind Farm 2 Project, Northern Long-eared Bat Desktop Summer Habitat Assessment, Campbell County, South Dakota Appendix D. 2020–2021 Avian Use Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota Appendix E. 2021 Raptor Nest Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota Appendix F. 2023 Raptor Nest Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota Appendix G. 2021 Lek Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota Appendix H. 2023 Lek Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota Appendix I. 2021 Prairie Dog Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota Appendix J. 2019–2020 Bat Acoustic Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota Appendix K. Consistency Evaluation Forms for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota Appendix L. 2023–2024 Avian Use Survey for the Campbell County Wind Farm 2 Project, Campbell County, South Dakota