# Willow Creek Wind Energy Facility Draft Environmental Assessment


## U.S. Department of Energy
## Western Area Power Administration

DOE/EA-2016

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## Butte County, South Dakota

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# LIST OF ABBREVIATIONS

| Abbreviation | Term/Phrase/Name |
|---|---|
| ADT | average daily traffic |
| BMP | best management practices |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| $CO_2$ | carbon dioxide |
| CRP | Conservation Reserve Program |
| dBA | A-weighted decibels |
| EA | Environmental Assessment |
| EPA | U.S. Environmental Protection Agency |
| FAA | Federal Aviation Administration |
| FPPA | Farmland Protection Policy Act |
| FSA | Farm Service Agency |
| FWS | U.S. Fish and Wildlife Service |
| GSU | generator step up transformer |
| HAP | hazardous air pollutant |
| JEDI | Jobs and Economic Development Impact |
| kV | kilovolt |
| LIDAR | light detection and ranging |
| MW | megawatt |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act of 1969 |

| Abbreviation | Term/Phrase/Name |
|---|---|
| NREL | National Renewable Energy Lab |
| NRHP | National Register of Historic Places |
| NWR | National Wildlife Refuge |
| O&M | operations and maintenance |
| PEIS | Programmatic Environmental Impact Statement |
| PPA | power purchase agreement |
| SCADA | supervisory control and data acquisition |
| SDDENR | South Dakota Department of Environment and Natural Resources |
| SDDOT | South Dakota Department of Transportation |
| SDGFP | South Dakota Game, Fish and Parks |
| SDGS | South Dakota Geological Survey |
| SHPO | State Historic Preservation Office |
| SODAR | sonic detection and ranging |
| SWPPP | Storm Water Pollution Prevention Plan |
| U.S.C. | United States Code |
| UGP | Upper Great Plains |
| USGS | United States Geological Survey |
| Western | Western Area Power Administration |
| Wind Quarry | Wind Quarry Operations, LLC |

# 1.0 INTRODUCTION

Wind Quarry Operations, LLC (Wind Quarry) proposes to construct the Willow Creek Wind Energy Facility (Project), a 103-megawatt (MW) nameplate capacity wind energy facility in Butte County, South Dakota. The Project Area consists of 22,324 acres of privately owned land approximately 10 miles northeast of Newell, South Dakota (Figure 1-1). The Project would include approximately 45 wind turbines, associated access roads, a new collector substation, an operations and maintenance (O&M) facility, and associated transmission interconnection facilities. Wind Quarry further proposes to interconnect the Project to Western Area Power Administration's (Western) Maurine to Rapid City 115-kilovolt (kV) transmission line, which passes through the Project Area. Interconnection would be at a new switchyard to be constructed by Western and located within the Project Area.

The interconnection of the proposed Project to Western's transmission system is a Federal action under the National Environmental Policy Act of 1969 (NEPA). This Environmental Assessment (EA) tiers off of the analysis conducted in the Upper Great Plains (UGP) Wind Energy Final Programmatic Environmental Impact Statement (PEIS), a document prepared jointly by Western and the U.S. Fish and Wildlife Service (FWS) (Western and FWS, 2015a). The PEIS assesses environmental impacts associated with wind energy development and identifies best management practices (BMPs) to avoid and minimize those impacts. As stated in the Executive Summary of the PEIS, as long as wind energy project developers are willing to implement the applicable evaluation process, BMPs, and conservation measures identified in the PEIS, the NEPA evaluation for that wind energy project may tier off the analyses in the PEIS. Applicable material from the PEIS is incorporated by reference in this EA in accordance with 40 Code of Federal Regulations (CFR) §§ 1502.20 and 1508.28. The analysis in this EA is Project-specific and focuses on site-specific issues that are not already addressed in sufficient detail in the PEIS. This EA is intended to be read in conjunction with the PEIS, and the EA and PEIS together comprise the NEPA clearance for this Federal action. Wind Quarry has committed to implementing the applicable BMPs and conservation measures from the PEIS to allow for tiering.

## 1.1 Western's Purpose and Need

Western's purpose and need is to consider and respond to Wind Quarry's interconnection request in accordance with the Southwest Power Pool (SPP) Tariff and the Federal Power Act as described in Section 1.1.1 of the PEIS. Western is currently operating under the SPP Tariff.

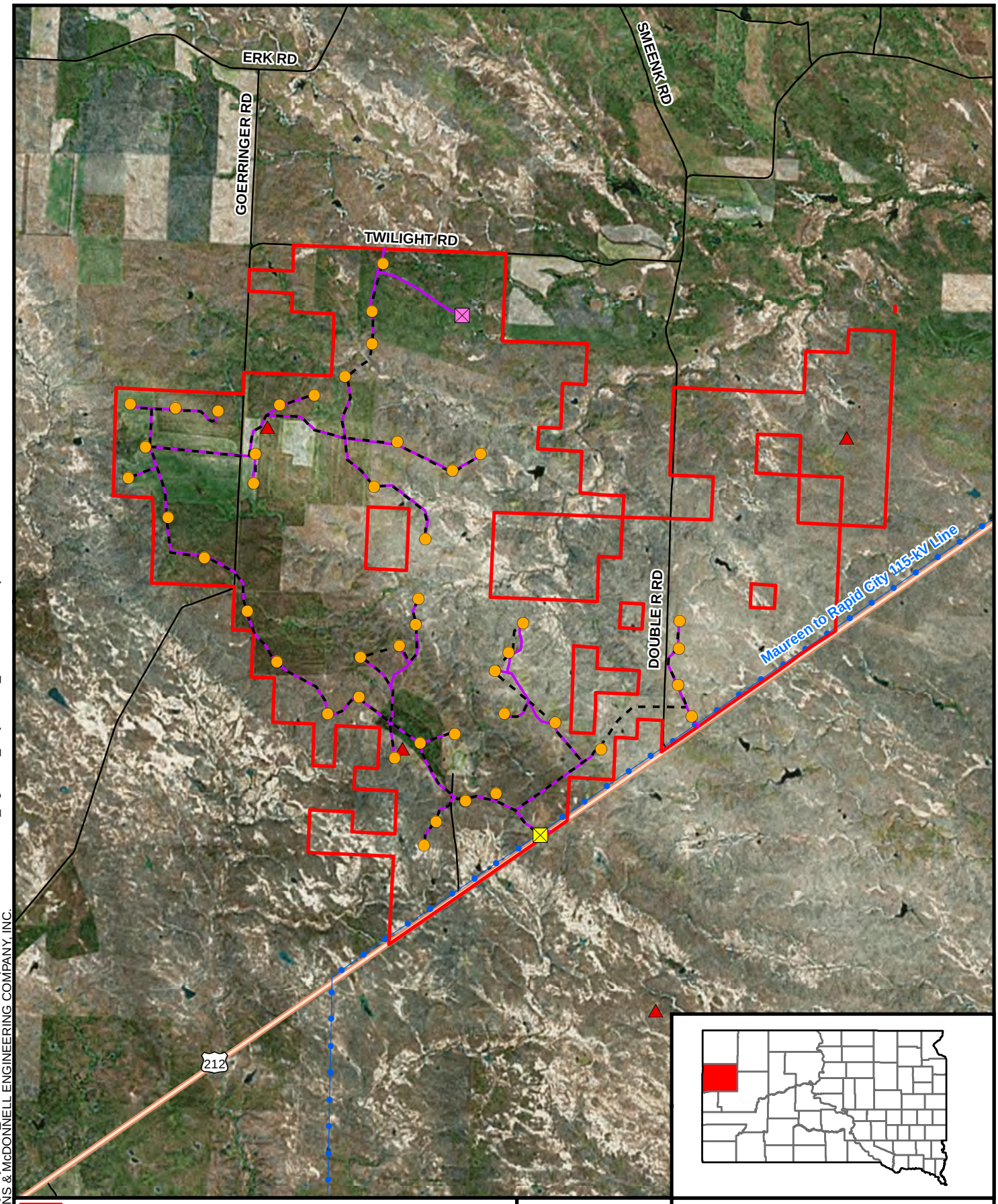


Figure 1-1
Proposed Wind Farm Layout
Willow Creek Wind
Energy Facility
Environmental Assessment

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Source: ESRI; SDDOT; Burns & McDonnell Engineering; DNV-GL

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## 1.2 Wind Quarry's Goals and Objectives

Wind Quarry's goals and objectives for the proposed Project are to provide an economically viable, reliable, and cost-effective source of renewable energy to users in the Dakotas and throughout Western's service area. To accomplish this purpose, the Project must be technically, environmentally, and economically feasible. To that end, Wind Quarry needs for the following factors to be present:

- A reliable wind resource capable of producing enough power for the Project to be economically viable,
- Landowners willing to participate in the Project,
- Environmental conditions that allow the Project to comply with applicable environmental regulation at a reasonable cost,
- An interconnection agreement with Western to transmit power to a power purchaser, and
- A power purchase agreement (PPA) for a duration and at a price that permits the Project to be economically viable.

# 2.0 DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVES

This EA analyzes two alternatives, the Proposed Action and the No Action Alternative.

## 2.1 Western's Proposed Action

Western's Proposed Action is to execute an interconnection agreement to connect Wind Quarry's proposed Project to Western's Maurine to Rapid City 115-kV transmission line. As part of the Proposed Action, Western would construct, own, and operate a new interconnection switchyard adjacent to the transmission line. This new switchyard would be enclosed by an approximately 150-foot by 200-foot fence and would include 115-kV gas-insulated circuit breakers, associated switches, bus work, and a control building. It would not include a transformer.

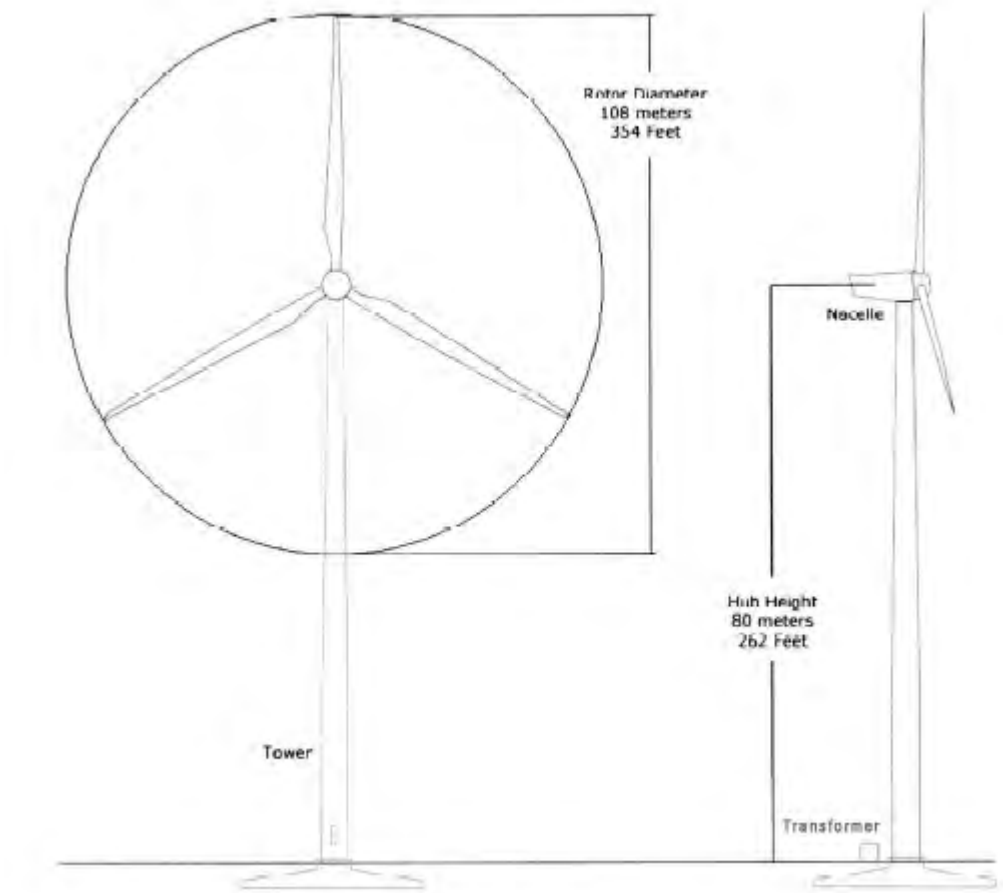
### 2.1.1 Willow Creek Wind Farm

If the interconnection agreement is executed, the Willow Creek Wind Farm would consist of approximately 45 2.3-MW wind turbines with an aggregate nameplate capacity of 103 MW. The Project would also include underground electric collector lines, a central collector substation (Willow Creek Substation), an approximately 100-foot-long 115-kV jumper interconnecting to the new Western-owned switchyard, an O&M facility, access roads connecting to each turbine, one to two permanent meteorological towers, a sonic detection and ranging (SODAR) unit, and a supervisory control and data acquisition (SCADA) system. Figure 1-1 shows the proposed layout of the Project facilities. The expected life of the Project is approximately 25 to 40 years (leases for the Project are 25 years, with an option to upgrade turbines and extend leases for an additional 15 years).

#### 2.1.1.1 Wind Turbines

Wind Quarry plans to install approximately 45 2.3-MW horizontal axis wind turbines for the Project. Each turbine would have a hub height of approximately 262 feet and a turbine rotor diameter of 354 feet. The total height of each turbine would be approximately 440 feet with a blade in the vertical position. Additional specifications for the proposed turbine model are provided for reference in Appendix A of this EA. Alternate wind turbine models may be considered for the Project. As turbine technology advances, manufacturers discontinue turbine models and release new ones. Other factors, such as cost and availability at the time of ordering, may dictate final selection of a turbine manufacturer and model. It is anticipated that the specifications for alternate models would be similar to the proposed turbine model and that the turbine layout would not be significantly affected should an alternate model be selected. Turbine towers will be cylindrical monopoles, approximately 262 feet in height (Figure 2-1). The towers would be

## Figure 2-1 Proposed Wind Turbine Dimensions




**Siemens SWT 2.3 – 108 Wind Turbine with 80 meter Tower**

constructed of high strength tubular steel, approximately 15 feet in diameter at the base, with internal joint flanges. Towers would be fabricated in three sections and assembled onsite. The tower color would be non-reflective light grey, and all surfaces would be multi-layer coated for protection against corrosion. Turbine nacelles and towers would be cleaned regularly to remove spilled or leaking fluids and the dirt and dust that accumulates over time. A controller cabinet would be located inside each tower base. Marking and lighting of the wind farm would be done in compliance with Federal Aviation Administration (FAA) regulations.

#### 2.1.1.2 Wind Turbine Foundations

The wind turbine foundations would typically be mat foundations (inverted T-foundations), as described in Section 3.3.2 of the PEIS, or concentric-ring-shell foundations of reinforced concrete. The actual foundation for each turbine would be specifically designed based on geotechnical analysis of a 50-foot core sample at each turbine location combined with structural loading requirements for the turbine. The pedestal diameter for a 262-foot tower is approximately 17 feet. In some cases, for step-and-touch voltage[1] compliance, an area around a turbine may be covered in 4 inches of gravel, river rock, or crushed stone. Figure 3.3-1 in the PEIS shows a typical foundation under construction. The excavated area for the turbine foundations would typically be approximately 70 feet by 70 feet (approximately 0.1 acre). During construction, a larger area (approximately 262 feet by 262 feet) would be used to lay down the rotors and maneuver cranes during turbine assembly (See Figure 3.3-3 in the PEIS).

#### 2.1.1.3 Generator Step-up Transformers

A generator step up transformer (GSU) would be installed at the base of each wind turbine to increase the output voltage of the wind turbine to the voltage of the power collection system (34.5-kV). The transformers would be mounted on concrete pads and would be placed next to each wind turbine.

#### 2.1.1.4 Access Roads

Approximately 26 miles of new or upgraded roads would be constructed to facilitate both construction and maintenance of the wind turbines. These roads have been designed to minimize length and construction impact. Initially, turbine access roads would be approximately 66 feet in width to accommodate the safe operation of construction equipment. Upon completion of construction, the turbine access roads would be reclaimed and narrowed to an extent allowing for the routine maintenance of the facility, or approximately 33 feet in width.

[1] Hazardous voltage that can occur between the feet of a person standing near an energized grounded object (step voltage) or between an energized grounded object and the feet of a person in contact with the object (touch voltage).

The wind turbines would be accessible from public roads via all-weather Class 5 gravel roads. Access roads would follow fence lines, field lines, and existing field access roads to the extent possible. Siting roads in areas with unstable soil would be avoided wherever possible. Roads would include appropriate drainage controls, including culverts, and would be constructed in a manner to allow farm and/or land owner equipment to cross. The access road cross sections would consist of graded soil, overlain by geotextile fabric (if needed), and surfaced with compacted aggregate base course. Final access road locations would be established with input from landowners. Gates would be installed where access roads cross landowner fences.

#### 2.1.1.5 O&M Facility

An O&M facility would be located in the southeast quarter of the southwest quarter of Section 14, Township 11 North, Range 7 East. The existing unfinished single-family home on the property would be finished to serve as the office, and a 5,000-square foot utility building would be erected for storage and maintenance work. The proposed O&M facility would house the equipment to operate and maintain the wind farm. A gravel parking pad would provide the building with a parking area.

#### 2.1.1.6 Meteorological Towers and SODAR Units

Wind Quarry has deployed four temporary 197-foot meteorological towers and two SODAR units within the Project Area. These temporary meteorological towers are expected to be removed within 1 year of Project construction. Wind Quarry anticipates that the Project would include wind measurement equipment, which could consist of a light detection and ranging (LIDAR) or SODAR unit, or one or two permanent 197-foot or 262-foot meteorological towers to house anemometers to measure the wind speed. The permanent towers would not have guy wires and would be lighted in compliance with FAA regulations. A LIDAR or SODAR unit is typically located near (within 300 feet) one of the permanent meteorological towers in a small trailer approximately 10 feet high with an attached 20-foot wind sensor boom. The purpose of the unit is to remotely measure the vertical turbulence structure and wind profile up to 656 feet in 32-foot increments.

#### 2.1.1.7 Temporary Laydown/Stockpile Areas/Batch Plant/Crane Walks

An approximately 40-acre temporary stockpile or laydown area would be selected within the Project Area. Turbine components may be temporarily stored within this area before being moved to the final turbine sites. One or more concrete batch plants may be necessary during construction in order to prepare concrete for foundations onsite. Each would temporarily impact approximately 3 acres of land, and it is anticipated that they would be located within the temporary laydown area. The location of the laydown area would be selected during final design; however, a preferred location would be an undeveloped or

previously disturbed area that is flat and does not contain streams, wetlands, or other environmentally sensitive resources.

In addition to the approximately 40-acre laydown/stockpile/batch plant area, temporary crane walk disturbances would also be necessary for the Project. Crane walks are estimated to be 40 feet wide and would be located along the approximately 26 miles of access roads. The temporary disturbance from the crane walks would be within the 66-foot-wide temporary construction disturbance width for the access roads and would not require additional grading beyond what is necessary for access road construction.

#### 2.1.1.8 34.5-kV Collector System

Each wind turbine within the Project Area would be interconnected by communication and electrical power collection circuit facilities. These facilities would include underground feeder lines (collector lines) that would collect wind-generated power from each wind turbine and deliver it to the collector substation.

This system would be used to route the power from each turbine to the Willow Creek Substation (collector substation) where the electrical voltage would be stepped up from 34.5 kV to 115 kV. The underground collector system would be placed in one or more parallel trenches and connect each of the turbines to the Willow Creek Substation. The estimated trench length, including parallel trenches, is 139,646 feet (approximately 26 miles).

The underground collector circuits would consist of three power cables contained in an insulated jacket and buried at a minimum depth of 4 feet that would not interfere with farming operations. Access to the underground lines would be located at each turbine site, at junction boxes located at points where the underground collector system cables are spliced, and where the cables enter into Willow Creek Substation. Due to the power carrying limits of underground cabling, there would be several segments of underground collector lines or circuits to collect power from the individual turbines. As such, several circuits would be installed within the same trench along segments of the collector system.

The underground electrical collector and communication systems generally would be installed by plowing or trenching the cables. Using this method, the disturbed soils and topsoil are typically replaced over the buried cable within one day, and the drainage patterns and surface topography are restored to pre-existing conditions. In grassland/rangeland areas, disturbed soils would be re-vegetated with a weed-free native plant seed mix.

The fiber optic communication cables for the Project would be installed in the same trenches as the underground electrical collector cables and would connect the communication channels from each turbine to the control room in the Willow Creek Substation.

#### 2.1.1.9 Collector Substation (Willow Creek Substation)

A new collector substation, Willow Creek Substation, would be constructed at the south end of the Project Area, on private rangeland, where the 34.5-kV electric collection grid and fiber optic communication network would terminate. Willow Creek Substation would include transformers to step up the voltage of the collection grid from 34.5 kV to 115 kV, above-ground bus structures to interconnect the substation components, breakers, a control building, relays, switchgear, communications and controls, and other related facilities required for delivery of electric power to the proposed adjacent 115-kV Western-owned switchyard.

The design of Willow Creek Substation is not finalized, but Wind Quarry expects it would be enclosed by a chain link fence with dimensions of roughly 300 feet by 200 feet. The substation components would be placed on concrete and steel foundations.

Willow Creek Substation would be designed in compliance with Federal, State and local regulations, National Electrical Safety Code (NESC) standards, and other applicable industry standards and would be interconnected to a new Western-owned interconnection switchyard. It is anticipated that the new Western-owned switchyard would be located adjacent to Willow Creek Substation, and the proposed transmission interconnection would consist of three jumpers, approximately 100 feet in length, between the two facilities. One steel deadend structure, approximately 65 feet in height, would be installed in each facility to connect the jumpers.

### 2.1.2 Project Life Cycle

Section 3 of the Final UGP Wind Energy PEIS describes the activities likely to occur during each of the major phases of a typical wind energy project's life cycle – site testing and monitoring, construction, operation, maintenance, and decommissioning. The same project phases, with similar types of activities for each phase, would occur for this proposed Project. Leases for the Project are 25 years, with a 15-year option to extend.

## 2.2 No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection agreement to its transmission system or construct a switchyard. For the purpose of impact analysis and comparison, it is

assumed that the proposed Willow Creek Wind Farm would not be built and the environmental impacts, both positive and negative, associated with construction and operation would not occur.

# 3.0 AFFECTED ENVIRONMENT

This section briefly describes the physical and regulatory environment that would be affected by Wind Quarry's proposed Project, Western's Proposed Action, or the No Action Alternative. Unless otherwise noted, the Affected Environment analysis applies to Western's switchyard as well as Wind Quarry's proposed Project. Resources addressed in the Final UGP Wind Energy PEIS are discussed below, with additional site-specific information presented where appropriate.

## 3.1 Land Cover and Land Use

As described in Section 4.1 of the PEIS, land cover refers to the physical material at the surface of the earth, while land use addresses how people use the land. Additional land use considerations described in the PEIS include recreation, transportation, aviation, and radar.

The dominant land cover type that occurs within the Project Area is grassland/herbaceous, followed by land planted for hay/pasture. There is no forestland within the Project Area and minimal shrubland. Land cover types within the Project Area are summarized in Table 3-1 and displayed on Figure 3-1.

**Table 3-1: Land Cover Types Within the Project Area**

| Land Cover Type[a] | Area (Acres) | Percentage of Project Area[b] |
|---|---|---|
| Barren land | 102 | 0.5% |
| Cultivated crops | 607 | 2.7% |
| Developed land | 137 | 0.3% |
| Hay/pasture | 3,623 | 16.2% |
| Grassland/herbaceous | 17,132 | 76.7% |
| Shrub/scrub | 659 | 3.0% |
| Forestland | 0 | 0.0% |
| Water/wetlands | 64 | 0.3% |

(a) National Land Cover Database 2011 classification system (MRLC, 2011)
(b) Due to rounding, percentages do not add up to 100%.

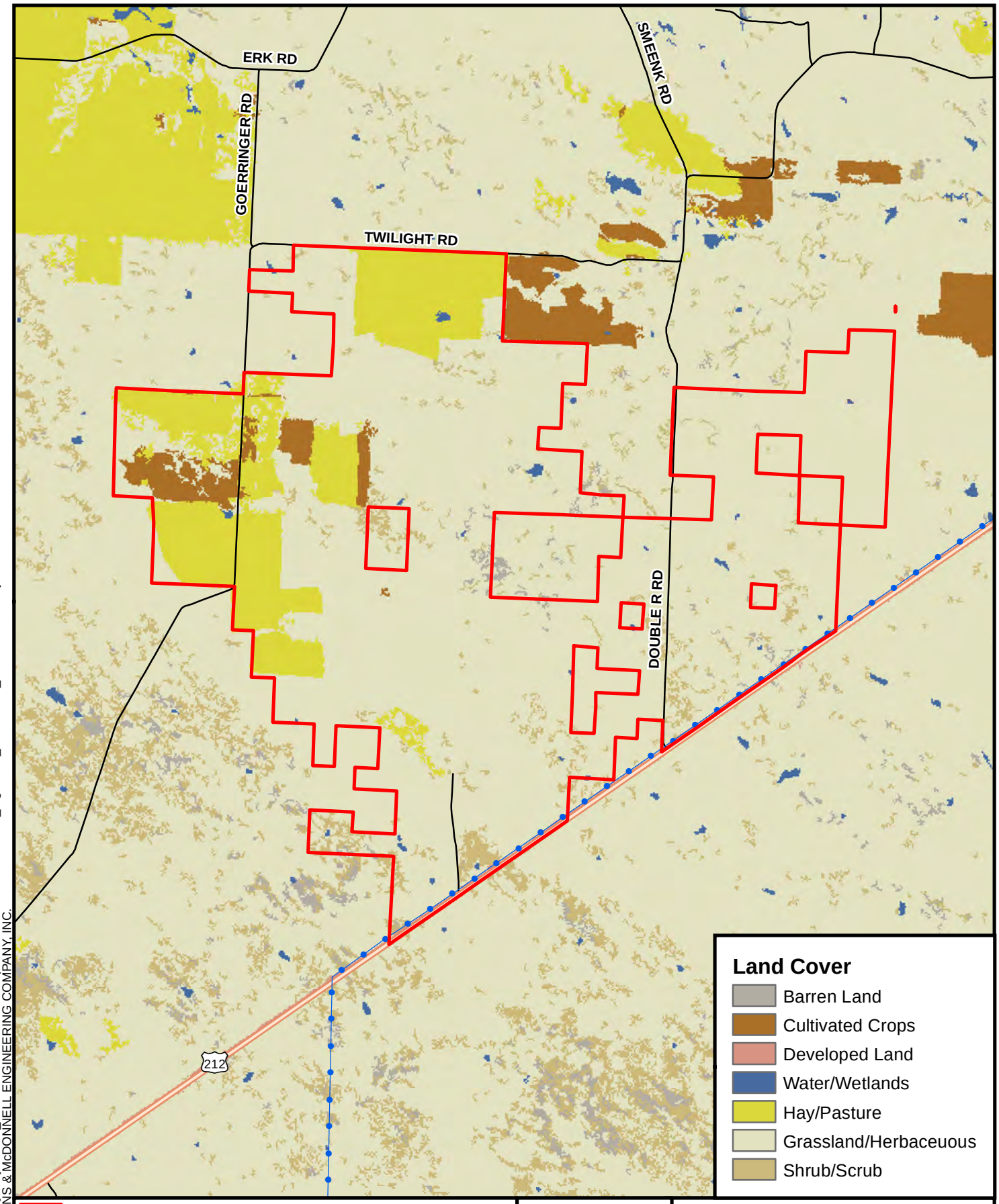



Figure 3-1
Land Cover Types
Willow Creek Wind
Energy Facility
Environmental Assessment

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Source: ESRI; SDDOT; NLCD; Burns & McDonnell Engineering; DNV-GL

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Land use within the Project Area is agricultural, the majority of which is used for rangeland. There are also some areas of cultivated cropland, as well as conservation lands enrolled in the Conservation Reserve Program (CRP). The CRP pays farmers a yearly rental payment in exchange for removing environmentally sensitive land from agricultural production (Farm Service Agency [FSA], 2016). The program limits surface disturbance from wind farms to 5 acres per CRP contract. Land uses within the Project Area are summarized in Table 3-2.

**Table 3-2: Land Uses Within the Project Area**

| Land Use[a] | Area (Acres) | Percentage of Project Area[b] |
|---|---|---|
| Rangeland | 16,753 | 75.0% |
| Cropland | 1,389 | 6.2% |
| Conservation Reserve Program lands | 4,109 | 18.4% |
| Other agricultural uses (e.g., stock ponds) | 73 | 0.3% |

(a) FSA, 2015
(b) Due to rounding, percentages do not add up to 100%.

The Project Area consists of private ranches with some scattered range improvements, such as fences, reservoirs, and stock tanks. There is one occupied rural residence within the Project Area and a few other scattered rural residences that are adjacent to, but outside of, the Project Area. Western's Maurine to Rapid City 115-kV transmission line extends adjacent to U.S. Highway 212 through the Project Area.

Prime farmlands are subject to protection under the Farmland Protection Policy Act (FPPA) (Public Law [PL] 97-98, 7 United States Code [U.S.C.] 4201 et seq.). The entire Project Area is classified as "not prime farmland" under the FPPA (see letter from USDA in Appendix H).

No public lands are located within the Project Area. Lands managed by the Bureau of Land Management, Bureau of Reclamation, and the South Dakota Office of School and Public Lands are located adjacent to, but outside of, the Project Area. There are approximately 11,107 acres of privately owned lands within the Project Area that are leased for public hunting access by South Dakota Game, Fish and Parks (referred to as Walk-In Areas). Based on correspondence with FWS (DeVries, 2015), there are no FWS grassland or wetland easements within the Project Area.

Table 3-3 lists the roads that intersect the Project Area. The primary access to the Project Area is from U.S. Highway 212, which extends along the southern boundary of the Project Area. U.S. Highway 212 is the only paved road in the Project Area. Twilight Road and Double R Road provide access to the Project

Area from the north, and U.S. Highway 212 and Wahlfeldt Road provide access to the Project Area from the south.

**Table 3-3: Project Area Roads**

| Road | Surface Type | Surface Width | Total Lanes |
|---|---|---|---|
| Double R Road | Gravel | 22 feet | 2 |
| Twilight Road | Gravel | 12 feet | 1 |
| U.S. Highway 212 | Paved asphalt | 24 feet | 2 |
| Wahlfeldt Road | Gravel | 16 feet | 2 |

Source: SDDOT, 2015

In 2014, average daily traffic (ADT) volume along U.S. Highway 212 through the Project Area was 580 trips, 15 percent of which were trucks (South Dakota Department of Transportation [SDDOT], 2014). ADT along Double R Road through the Project Area was 18 trips (collected in 2011) (SDDOT, 2015).

There are no airports located within the Project Area. The closest airport is Bruch Airfield, which is a private airstrip located in Sturgis, South Dakota, approximately 23 miles south of the Project Area. The closest public airports to the Project Area are Sturgis Municipal Airport, located approximately 28 miles south of the Project Area near Sturgis, and Belle Fourche Municipal Airport, located approximately 28 miles west of the Project Area near Belle Fourche. The nearest U.S. air military installation is Ellsworth Air Force Base, located approximately 45 miles south of the Project Area.

## 3.2 Geologic Setting

The Project Area is located within the Great Plains physiographic province. Section 4.2.1 of the Final UGP Wind Energy PEIS includes a detailed discussion of the Great Plains province. The physiographic features of the Project Area, consisting of smooth hills and ridges and shallow meandering drainages, were formed as the underlying bedrock was eroded by the action of wind and water.

The surficial geology of the Project Area consists of a veneer of residual soils underlain by the Pierre Shale bedrock. Minor areas of alluvial deposits consisting of sediments derived from the Pierre Shale are found within the Sulphur Creek drainages of the northern extents of the Project Area.

The soils within the Project Area primarily consist of clays derived from the underlying Pierre Shale bedrock. These soils are generally well-drained and are not highly susceptible to erosion. Soils in the Project Area are generally deep, or greater than 28 inches to bedrock.

Commercially viable mineral deposits within Butte County are limited to sand, gravel, and construction aggregates and bentonite. Information from the South Dakota Department of Environment and Natural Resources (SDDENR) Minerals and Mining Program and a review of United States Geological Survey (USGS) 7.5 minute quadrangle mapping indicates no such deposits have been developed within the Project Area. The nearest active gravel quarry is approximately 25 miles northeast of the Project Area (SDDENR, 2015a).

The risk of seismic activity in the vicinity of the Project Area is very low. The USGS Earthquake Hazards Program estimates a 0.0 to 1.0 percent probability that a Magnitude 5 or greater earthquake will occur within 30 miles of the Project Area within the next 20 years. According to the South Dakota Geological Survey (SDGS), no earthquakes have been recorded in Butte County, South Dakota from 1872 to 2013 (SDGS, 2013). Available geologic mapping and information from the USGS Earthquake Hazards Program do not indicate any active or inactive faults within the Project Area (USGS, 2009).

The risk for subsidence within the Project Area is considered negligible. The Pierre Shale bedrock is present at the surface, or beneath a veneer of residual soil, throughout most of the Project Area and is not known to develop karst topography or contain layers or members susceptible to dissolution by water. No historic underground mining operations, which could lead to subsidence potential, exist within the Project Area.

## 3.3 Hydrologic Setting and Water Resources

The Project Area is located within the Missouri River Basin surface water drainage system. Section 4.3.1 of the Final UGP Wind Energy PEIS includes a detailed discussion of this drainage system. Streams within the Project Area consist of intermittent streams and shallow, ephemeral drainages that temporarily carry rainwater. Riparian areas are heavily grazed and trampled, and vegetation consists of grasses with some small, narrow bands of sedges. Other surface waters in the Project Area include non-permanent emergent wetlands and impounded stock ponds, discussed further in Section 3.6.1.

Within the Project Area, narrow floodplains exist along South Double R Creek and an unnamed tributary to this stream (Figure 3-2). All floodplains within the Project Area are mapped as Zone A, indicating no base flood elevations have been determined.

The Project Area is located within the Northern Great Plains Aquifer System, which includes five major aquifers: (1) lower Tertiary; (2) upper Cretaceous; (3) lower Cretaceous; (4) upper Paleozoic; and (5) lower Paleozoic (USGS, 1996). Section 4.3.2 of the PEIS includes a more detailed discussion of this aquifer system.

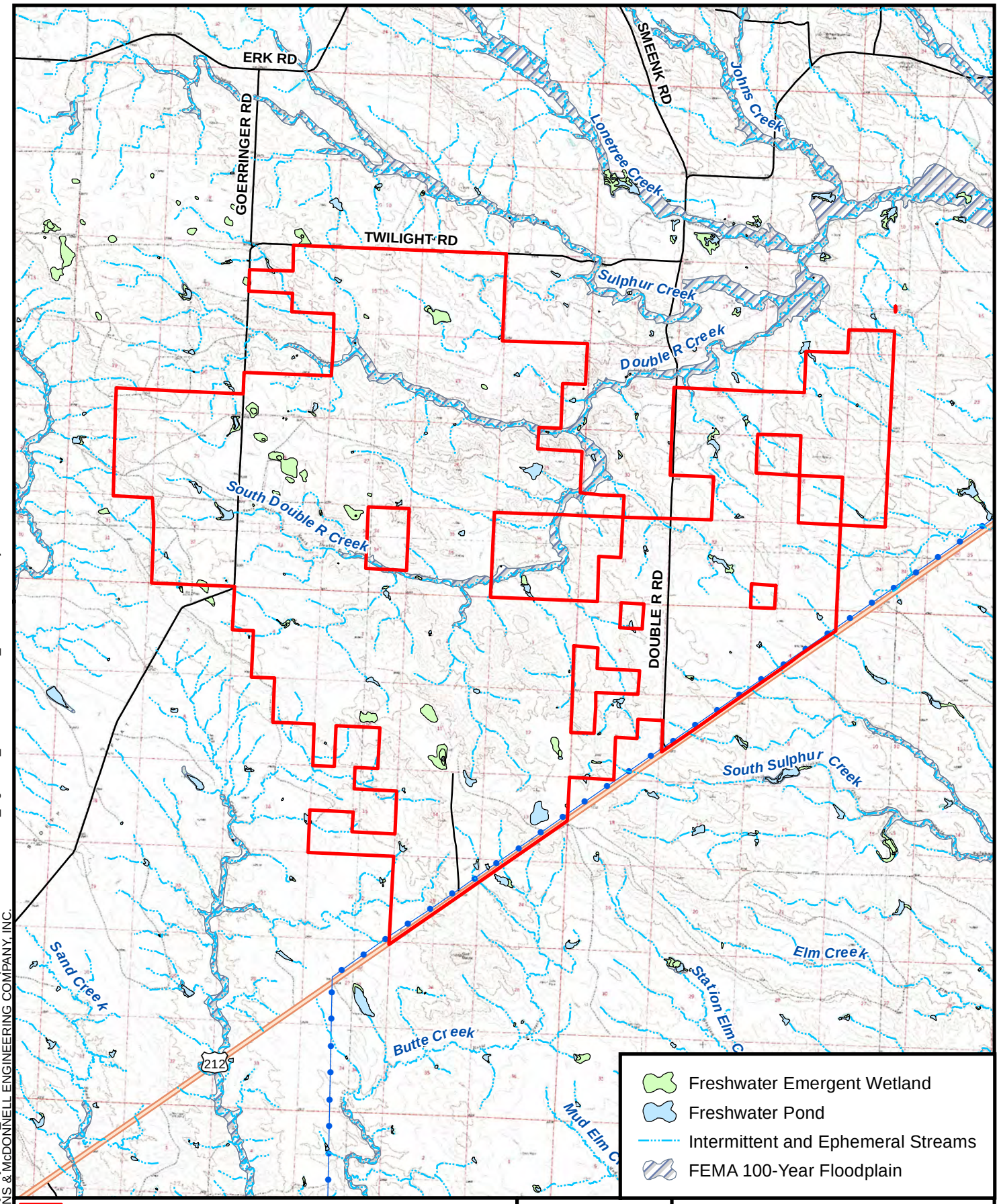


Figure 3-2
Water Resources
Willow Creek Wind
Energy Facility
Environmental Assessment

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Source: ESRI; SDDOT; FWS NWI; USGS NHD; FEMA; Burns & McDonnell Engineering; DNV-GL

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## 3.4 Air Quality and Climate

General air quality and climate conditions for South Dakota and the UGP Region are discussed in Section 4.4 of the Final UGP Wind Energy PEIS. This section of the PEIS describes general meteorological conditions; existing emissions of criteria pollutants and volatile organic compounds (VOCs); the federally based air quality programs likely to affect activities associated with wind energy development; and greenhouse gas emissions (GHGs).

The entire State of South Dakota is in attainment for all National Ambient Air Quality Standards (NAAQS) criteria pollutants (U.S. Environmental Protection Agency [EPA], 2015). The nearest ambient air quality monitoring site to the Project Area is located in Black Hawk, Meade County, South Dakota, which is south of the Project Area (SDDENR, 2015b). The primary emission sources that exist within the Project Area include agriculture related equipment and vehicles traveling along U.S. Highway 212. The nearest Prevention of Significant Deterioration (PSD) Class I Area to the Project Area is Badlands National Park, located approximately 75 miles southeast. PSD Class I Areas are discussed in Section 4.4.2.3 in the PEIS.

## 3.5 Acoustic Environment

Section 4.5 of the Final UGP Wind Energy PEIS includes a discussion of noise and vibration and the existing acoustic environment in the UGP Region. Because the Project Area contains rangeland, cropland, and very few residences scattered throughout, background noise levels in the Project Area are estimated to be in the range of 33 to 47 A-weighted decibels (dBA), which is typical of rural and undeveloped areas (Section 4.5.1.5 of the PEIS). Given that this is a windy location, wind is a large contributor to noise. Aside from wind, farming activities and occasional vehicular traffic would be the largest contributor to noise in an area such as this. Butte County does not currently have noise regulations or a wind energy ordinance. However, the South Dakota Public Utilities Commission developed a draft model wind ordinance for communities to use as guidance, which suggests that noise levels not exceed 55 dBA, as measured at the nearest residence.

## 3.6 Ecological Resources

Ecological resources (i.e., plant communities, wildlife, aquatic biota, and threatened, endangered, and special status species) within the UGP Region are discussed in Section 4.6 of the Final UGP Wind Energy PEIS. The following sections describe the site-specific ecological resources within the Project Area.

### 3.6.1 Plant Communities

The Project Area is located within the Northwestern Great Plains Level III ecoregion. Section 4.6.1 and Appendix C of the PEIS include a detailed discussion of this ecoregion. Vegetation communities in this ecoregion and the Project Area are generally simple with a low diversity of species. The area is semiarid with 13 to 15 inches of annual precipitation (Bryce, et al., 1998). Approximately 75 percent of the Project Area is comprised of western wheatgrass-dominated grasslands interspersed with some areas of blue grama. Bare ground can exceed 15 percent in these grasslands. Under certain seasonal conditions, yellow sweetclover can become dominant, changing the overall vegetation composition, height, and density. The remaining 25 percent of the Project Area is dominated by introduced grasslands mixed with alfalfa. These areas include portions along the north and west of the Project Area that have been converted to alfalfa and alfalfa/grass mixtures for hay. Other sites have been reclaimed to grasslands largely dominated by intermediate wheatgrass, smooth brome, western wheatgrass, and some orchard grass mixed with alfalfa. These areas are hayed, but not necessarily each year.

Based on a review of FWS National Wetland Inventory (NWI) data, approximately 328 acres of wetlands and ponds occur within the Project Area (Figure 3-2). A detailed discussion of wetlands in the UGP Region is provided in Section 4.6.1.2 of the PEIS. The types of wetlands found in the Project Area are typical of this region and consist of approximately 197 acres of seasonally or temporarily flooded emergent wetlands associated with intermittent streams and 131 acres of stock ponds. The predominant vegetation in these wetlands is foxtail barley and curly dock. Riparian areas and vegetation around stock ponds is heavily grazed and trampled.

### 3.6.2 Wildlife

Information on wildlife, including reptiles, amphibians, birds, and mammals within the UGP Region, is discussed in Section 4.6.2 of the PEIS. Wildlife species in the Project Area are typical of those found in the region and discussed in the PEIS. Wildlife surveys were conducted for the Project between 2011 and 2015. Surveys were conducted to assess abundance, distribution, and habitat affinities of wildlife across the Project Area, with specific assessments conducted for raptors; threatened, endangered, and special status species; upland game birds; bats; big game; predators; and prairie passerine birds. Detailed discussion of the methodology and results of the wildlife surveys conducted for the Project are reported in *Willow Creek Wind Project Wildlife Inventories and Bird and Bat Conservation Strategy* (see Appendix B).

As discussed in the wildlife report, reptiles and amphibians may be locally abundant in suitable microsites, but overall densities are low. Eight reptiles, consisting of three turtle species and five species

of snakes, were observed during surveys. None of the reptile or amphibian species observed are federally listed or state-listed threatened or endangered species.

A total of 118 avian species, including 20 raptor species, were observed during surveys. Ferruginous hawks, followed by rough-legged hawks, and golden eagles were the most abundant raptor species encountered. Golden eagles forage across the Project Area and nest to the north and south. Bald eagles were also observed during surveys, and bald eagle nests were observed along the Belle Fourche River, approximately 10 to 25 miles south of the Project Area. The status of eagles and migratory birds within the Project Area are discussed further in the wildlife report (Appendix B).

Mammal species inhabiting the Project Area are typical of semiarid grasslands of the Northwestern Great Plains, with pronghorn as the primary native big game species. Other big game species observed in the Project Area include mule deer and white-tailed deer. Several species of bats, including long-eared myotis, little brown bats, big brown bats, and hoary bats, were detected during acoustical survey efforts for the Project.

### 3.6.3 Aquatic Biota

The Project Area is located within the Missouri hydrologic region. Aquatic biota typical of this region is discussed in Section 4.6.3 of the PEIS. Aquatic habitat in the Project Area is marginal and intermittent. As discussed in Section 3.3, streams within the Project Area consist of intermittent streams and ephemeral drainages, with limited riparian vegetation. Ephemeral wetlands and stock water impoundments also occur throughout the Project Area, as discussed in Section 3.6.1. These surface waters support limited aquatic biota, which may include aquatic insects, crustaceans, and mollusks. There are no perennial streams within the Project Area that would support substantial native fish fauna.

### 3.6.4 Threatened, Endangered, and Special Status Species

Section 4.6.4 of the PEIS describes the plant and animal species that are listed as threatened or endangered under the Endangered Species Act (ESA), or that are proposed or candidates for listing under the ESA, and that could occur within the UGP Region. Federally listed species that could potentially occur in the Project Area are whooping crane (listed as endangered) and northern long-eared bat (listed as threatened) (FWS, 2015a). No critical habitat has been designated for these species within the Project Area. At the time the PEIS was prepared, the northern long-eared bat was proposed for listing, and the greater sage-grouse and Sprague's pipit were candidates. The northern long-eared bat has since been listed as threatened with a 4(d) rule (FWS, 2016a) and associated Programmatic Biological Opinion

(PBO) (FWS, 2015b), and the greater sage-grouse (FWS, 2015c) and Sprague's pipit (FWS, 2016b) are no longer candidates for listing.

The FWS listed the northern long-eared bat as threatened and issued a 4(d) rule allowing incidental take of the species resulting from otherwise lawful activities, including wind farm construction and operation. This 4(d) rule and the associated PBO received intra-agency programmatic ESA Section 7 consultation within the FWS and is intended for use by other agencies to streamline consultation for northern long-eared bats. Under the provisions of the 4(d) rule, incidental take is not prohibited for wind farm construction and operation in areas of the country not affected by white nose syndrome. Incidental take is not prohibited for wind farm construction and operation more than 0.25 mile from known hibernacula and more than 150 feet from known roost trees within areas of the country affected by white nose syndrome.

The UGP Wind Energy Programmatic Biological Assessment (BA), prepared in conjunction with the PEIS, describes the whooping crane and northern long-eared bat in detail (Western and FWS, 2015c). Additional information on the northern long-eared bat published subsequent to the PEIS and BA is available in the FWS's 4(d) rule and PBO available online at http://www.fws.gov/Midwest/endangered/mammals/nleb/s7.html. Updated species-specific information and results of the preconstruction evaluations and wildlife surveys, including surveys for federally listed species (as warranted), conducted for the Project are reported in the wildlife report (Appendix B). As discussed in the wildlife report, no whooping cranes were observed during field surveys for the Project, and minimal suitable stopover habitat is present within the Project Area. Furthermore, the Project Area is located outside of the 95 percent whooping crane migration corridor, or the approximately 220-mile wide corridor within which approximately 95 percent of whooping crane sightings occur (Western and FWS, 2015c). No northern long-eared bats were observed during acoustical surveys for the Project. High quality northern long-eared bat habitat is absent in the Project Area. Suitable habitat for this species may be found approximately 12 miles south of the Project Area along the Belle Fourche River. The nearest documented northern long-eared bat hibernaculum is near Hill City in the Black Hills, approximately 65 miles south of the Project Area.

## 3.7 Visual Resources

Visual resources within the UGP Region are discussed in Section 4.7 of the Final UGP Wind Energy PEIS. Rangeland, cropland, large open vistas, and gently rolling topography visually dominate the Project Area landscape. Visual impacts to the landscape attributable to the Project would depend on the extent to which the existing landscape is already altered from its natural condition, the number of viewers (residents, travelers, visiting recreational users, etc.) within visual range of the area, and the degree of

public or agency concern for the quality of the landscape. There is one occupied residence within the Project Area and a few other scattered rural residences that are adjacent to, but outside of, the Project Area. Travelers through the Project Area include local or regional traffic along U.S. Highway 212. Recreational users in the Project Area include hunters accessing Walk-In Areas or private hunting leases. The Project Area does not contain public land.

Scenic resources with sensitive viewsheds within the UGP Region are discussed in Section 4.7 of the PEIS. The nearest scenic resources to the Project Area are Belle Fourche National Wildlife Refuge (NWR) located 20 miles southwest of the Project Area and Bear Butte located 25 miles south of the Project Area. Bear Butte, located within Bear Butte State Park, is a geologic formation that is sacred to many Native American tribes who come to the site to hold religious ceremonies. Bear Butte is listed on the National Register of Historic Places (NRHP) and is a designated National Natural Landmark and National Historic Landmark.

## 3.8 Paleontological Resources

As discussed in Section 4.8 of the Final UGP Wind Energy PEIS, the UGP Region is composed of sedimentary rocks that have the potential to contain significant fossils; however, occurrence of significant fossils is rare. The surface geology of the Project Area has been classified and scored by the Potential Fossil Yield Classification (PFYC) system. The PFYC assigns a numeric score between 1 and 5, with 5 representing the highest potential for fossil materials to be present. Paleontological localities are common in formations with a PFYC rating of 5.

The majority of the Project Area is underlain by Pierre Shale bedrock, with a PFYC rating of 4. Minor areas of alluvial deposits found within the Sulphur Creek drainages of the northern extents of the Project Area also have a PFYC rating of 4. Significant rock outcroppings are not present within the Project Area. As discussed in Section 3.2, soils in the Project Area are generally deep, or greater than 28 inches.

## 3.9 Cultural Resources

Section 4.9 of the Final UGP Wind Energy PEIS describes the legal framework for managing cultural resources in the United States, including Federal agency responsibilities under Section 106 of the National Historic Preservation Act (NHPA). This section of the PEIS also provides a brief overview of the cultural context of the UGP Region, or what is known about the settlement and past use of the Great Plain Region.

A records search of the State Historic Preservation Office (SHPO) files was conducted for the Project on July 17, 2015, to identify known archeological sites, historic period structures, previous archeological

surveys, and other cultural resources data within the area of potential effects (APE) for the Project. The Project's direct and visual APE were determined in consultation with SHPO. The direct APE is the facility footprint (lease area), and the visual APE is a 2-mile buffer around the turbines. The NRHP and the National Historic Landmarks online databases were also reviewed. The records search indicated no previously recorded historic structures within the direct or visual APE. Nine previously recorded archaeological sites were identified within the APE (Table 3-4). It is Western's practice to avoid all sites potentially eligible for listing in the NRHP. If an unevaluated site cannot be avoided, it would be evaluated for NRHP eligibility, and the criteria for adverse effects would be assessed.

**Table 3-4: Previously Recorded Archaeological Sites within Project APE**

| Resource | Resource Type | NRHP Status |
|---|---|---|
| 39BU0014 | Stone circle | Unevaluated |
| 39BU0142 | Stone circle; cairn | Unevaluated |
| 39BU0143 | Stone circle; artifact scatter | Unevaluated |
| 39BU0144 | Isolated find | Not Eligible |
| 39BU0145 | Cairn; isolated find | Unevaluated |
| 39BU0146 | Artifact scatter | Unevaluated |
| 39BU0147 | Isolated find; stone circle | Unevaluated |
| 39BU0148 | Stone circle; cairn | Unevaluated |
| 39BU0158 | Stone circle; artifact scatter | Unevaluated |

Class III cultural resources field investigations were conducted for the Project between July 21 and September 2, 2015, and between March 17 and 22, 2016. Both Native American and historic period cultural resources were discovered during the field investigations (see table in Appendix C). The previously recorded sites were also visited and evaluated for the NRHP, unless access was denied by the landowner. Within the direct APE for the Project, nine archaeological sites are recommended as eligible for the NRHP. In the visual APE for the Project, three archaeological sites and four historic structures are recommended as NRHP-eligible.

## 3.10 Socioeconomics

Section 4.10 of the Final UGP Wind Energy PEIS discusses the socioeconomic environment potentially affected by the development of wind resources in the UGP Region. The PEIS describes 10 key measures of economic development: employment, unemployment, personal income, State sales and income tax

revenues, population, vacant rental housing, State and local government expenditures and employment, and recreation. Table 3-5 lists the key measures of economic development applicable to the Project Area. Data is reported for Butte County and South Dakota for the most recent year available. South Dakota does not currently have a State income tax, and, therefore, this measure is not reported in the table.

**Table 3-5: Key Measures of Economic Development**

| Economic Development Measures (Year) | Butte County | South Dakota |
|---|---|---|
| Employment (2014)[a] | 4,913 | 432,973 |
| Unemployment rate (2014)[a] | 3.4% | 3.4% |
| Per capita personal income (2013)[b] | $31,946 | $46,039 |
| State sales tax revenue (2012)[c] | N/A | $1.2 billion |
| Population (2014)[d] | 10,298 | 814,180 |
| Rental vacancy rate (2013)[e] | 3.5% | 6.0% |
| State and local government expenditures (2012)[c] | N/A | $6.9 billion |
| State and local government employment (2012)[c] | N/A | 62,046 |
| State recreation sector income (2006)[f] | N/A | $763 million |

(a) BLS, 2015
(b) BEA, 2014
(c) U.S. Census Bureau, 2012
(d) U.S. Census Bureau, 2014
(e) U.S. Census Bureau, 2013
(f) Western and FWS, 2015a

## 3.11 Environmental Justice

As discussed in Section 4.11 of the Final UGP Wind Energy PEIS, Executive Order 12898 requires Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their actions, programs, or policies on minority and low-income populations. An environmental justice analysis was conducted for this Project based on the methodology described in the PEIS and the 1997 Council on Environmental Quality (CEQ) guidance referenced therein.

For this Project, minority populations were identified by determining the percentage of minority residents for the census tract in which the Project Area is located. Low-income populations were identified based on poverty rates for the population of this census tract. Butte County as a whole and the State of South Dakota were selected as comparison areas. Based on the CEQ guidance, if the minority or low-income populations of the census tract exceed 50 percent or exceed the county or State levels by greater than 20 percent (i.e., “meaningfully greater than the general population”), the census tract would be defined as a minority or low-income population.

Table 3-6 displays the percentage of minority and low-income residents for the census tract in which the Project Area is located. As indicated in this table, the percentages of minority and low-income residents in the census tract do not exceed 50 percent nor do they exceed Butte County or State levels by greater than 20 percent. Therefore, according to CEQ guidance, there are no minority or low-income populations in the Project Area.

**Table 3-6: Minority and Low-Income Populations**

| Location | Total Population | Percent Minority[a] | Percent Below Poverty |
|---|---|---|---|
| Census Tract 9676 | 3,295 | 9.3% | 10.8% |
| Butte County | 10,197 | 7.8% | 10.2% |
| South Dakota | 825,198 | 15.9% | 14.1% |

Source: U.S. Census Bureau, 2013

(a) Minority is calculated by adding the populations for all non-white races and the population for white-Hispanic

# 4.0 ENVIRONMENTAL CONSEQUENCES

This section describes the environmental consequences of Wind Quarry's proposed Project, Western's Proposed Action, and the No Action Alternative. The analysis tiers off of the Final UGP Wind Energy PEIS. Section 5 of the PEIS discusses the potential direct and indirect environmental impacts of wind energy development in the UGP Region and identifies BMPs and conservation measures to address impacts. As discussed below for each resource, the potential impacts of the proposed Project fall within the type and range of impacts identified in the PEIS. Additional site-specific impact information is presented below for each resource, where appropriate. Wind Quarry would implement the applicable BMPs, avoidance, and minimization measures for this Project, which are derived from Section 5 of the PEIS and the Programmatic BA. Appendix D of this EA includes a list of the specific measures Wind Quarry has committed to implement. Commitment to these measures allows for this EA to tier off the analysis in the PEIS.

For purposes of calculating temporary impacts in this application, it is assumed that Wind Quarry's proposed Project would result in approximately 331 acres of total temporary ground disturbance during construction. After construction, it is assumed that total permanent disturbance from the Project would be reduced to approximately 109 acres. A breakdown of temporary and permanent disturbance by Project component is included in Appendix E. Western's switchyard would result in approximately 1 acre of temporary disturbance during construction and 0.7 acre of permanent disturbance.

## 4.1 Land Cover and Land Use

General direct and indirect effects to land cover and land use from wind energy development are addressed in Section 5.1 of the Final UGP Wind Energy PEIS, and those impacts are consistent with those expected for this specific Project. Western's switchyard would result in the permanent loss of approximately 0.7 acre of rangeland and temporary disturbance to approximately 1 acre during construction. Wind Quarry's proposed Project would result in approximately 331 acres of temporary loss and 109 acres of long-term loss of agricultural land, including rangeland, cropland/hayland, and CRP lands, due to construction of the wind turbine foundations, access roads, transmission interconnection facilities, and other associated facilities. Of the 45 proposed wind turbines, 29 would be constructed in rangeland, 3 in cropland/hayland, and 13 in CRP lands. Approximately 1.5 percent of total land within the Project Area, or 331 acres out of 22,324 acres, would be impacted by temporary construction disturbance, and less than 1 percent of the total land within the Project Area (109 acres out of 22,324 acres) would be impacted in the long-term. Areas disturbed due to construction that would not host permanent Project facilities would be re-vegetated with vegetation types matching the surrounding agricultural landscape, as

specified in Section 5.6.2.3 of the PEIS. Agricultural activities could occur up to the edge of access roads and turbine pads. Access roads and turbine pads would not be fenced off except for gates/cattle guards installed in landowner fences. Livestock and the landowners would be able to cross access roads and move about unimpeded. The buried underground collection system would not alter agricultural activities in the long-term. Wind Quarry would coordinate with landowners and the FSA for turbines constructed on CRP lands to avoid Project conflicts with FSA policies or management plans for CRP contracts.

Based on the current Project layout, there would be 31 turbines (and associated access roads and collector lines) placed on privately owned Walk-In Areas. During Project construction, there could be temporary access disruptions to these areas, and certain areas could be unavailable for hunting during the construction period, typically only one season. During operation of the Project, permanent impacts to these lands would result due to placement of turbines and access roads. However, these areas would remain open to hunting during Project operation. The Project access road system could potentially improve access to Walk-in Areas for public hunting if allowed to be used for that purpose. Wind Quarry would coordinate with South Dakota Game, Fish and Parks (SDGFP) regarding impacts to Walk-In Hunting Areas.

The Project would not result in any permanent impacts to the area's ground transportation resources. There will be some improvements to gravel roads and temporary impacts to local roads during the construction phase of the Project. Wind Quarry would work with the SDDOT and Butte County to obtain the appropriate access and use permits, and to minimize and mitigate the impacts to area transportation.

The air traffic generated by the airports listed in Section 3.1 would not be impacted by the proposed Project. Wind Quarry would follow FAA regulations for marking towers and would implement the necessary safety lighting. Notification of construction and operation of the wind energy facility would be sent to the FAA, and FAA-required mitigation measures would be implemented.

Appendix D of this EA lists BMPs and conservation measures from Section 5.1.2 of the PEIS that are applicable to the Project and that Wind Quarry has committed to implementing to allow for tiering.

Under the No Action Alternative, there would be no Project developed and, therefore, no related changes to land cover or land use within the Project Area.

## 4.2 Geologic Setting and Soil Resources

Section 5.2 of the Final UGP Wind Energy PEIS describes impacts on soil resources from wind energy development and discusses the types of geologic hazards that may be encountered in the UGP Region.

The potential impacts on geologic and soil resources that would result from the proposed Project fall within the type and range of impacts identified in the PEIS.

Western's switchyard would result in the permanent impact to 0.7 acre of soil within the switchyard footprint and temporary disturbance to an additional 0.3 acre. Construction of the wind turbine foundations, access roads, collector lines, substation, and O&M facilities would result in approximately 331 acres of temporary disturbance and approximately 109 acres of permanent impacts to soils within the Project Area. During construction, existing vegetation would be removed in the areas associated with the proposed Project components, potentially increasing the risk of erosion. Wind Quarry has designed the Project to minimize construction cut and fill work and avoid construction in steep slope areas. As specified in Section 5.2.3.1 of the PEIS, placement of wind energy facilities and access roads in areas with excessive slopes would be avoided. The turbine locations and access roads were sited to avoid areas with slopes exceeding 15 percent.

Construction of the Project would require coverage under the General Permit for Storm Water Discharges Associated with Construction Activities issued by the SDDENR. A condition of this permit is the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would be developed during civil engineering design of the Project and would incorporate BMPs to control erosion and sedimentation, as identified in Section 5.2.3.1 of the PEIS and noted in Appendix D of this EA.

The geological and geotechnical conditions within the Project Area are generally favorable and not anticipated to control or impact development of the Project. Excavation, bearing, and groundwater conditions associated with the shallow Pierre Shale bedrock throughout the Project Area are conducive to construction and operation of the wind turbine tower foundations and access roadways.

Prior to construction, soil borings would be performed at all wind turbine locations to develop the specific design and construction parameters. Laboratory testing of soil samples obtained from the site and geophysical surveys would be performed to determine the engineering characteristics of the site subgrade soils. If necessary, corrections to roadway and foundation subgrade would be prescribed depending on soil conditions.

Implementation of the BMPs and conservation measures identified in Appendix D of this EA, derived from Section 5.2.3 of the PEIS, would avoid or minimize impacts on geological and soil resources. No significant impacts are anticipated.

No Project-related impacts on geological or soil resources would occur with the No Action Alternative.

## 4.3 Water Resources

Section 5.3 of the Final UGP Wind Energy PEIS discusses the potential impacts on water resources resulting from wind energy projects in the UGP Region. The potential impacts on water resources that would result from the proposed Project fall within the type and range of impacts identified in the PEIS. As discussed in Section 3.3, water resources in the Project Area consist of seasonal streams and wetlands and stock ponds.

Western's switchyard would be located in a relatively level area well away from drainages. The area within the fence would have runoff controls consistent with the BMPs and conservation measures in Appendix D, and the disturbed area outside the fence would be reclaimed and reseeded with a weed-free native plant seed mix. The approximately 109 acres of permanent impacts planned for the Willow Creek Project are broadly dispersed and represent less than 1 percent of the total acreage in the Project Area. The Project would not cause significant changes in runoff patterns or volume of runoff, nor would it have adverse impacts on existing hydrology. The wind turbines, access roads, and collector system have been sited to avoid direct impacts to the seasonal streams and drainageways in the Project Area.

Approximately 331 acres would be temporarily disturbed as a result of construction of turbines, substation, access roads, underground collector lines, O&M facility, meteorological equipment, and temporary laydown areas. During and after construction, BMPs identified in Appendix D, derived from Section 5.3.2 of the PEIS, would be implemented to control erosion and minimize potential for sediment runoff from exposed soils during precipitation events. Implementation of these BMPs and conservation measures would avoid or minimize impacts on water resources associated with the Proposed Action.

No effects to water resources would occur as a result of the No Action Alternative.

## 4.4 Air Quality and Climate

Section 5.4 of the Final UGP Wind Energy PEIS describes potential impacts on ambient air quality and climate that could occur in the UGP Region from wind energy development. Potential impacts on air quality expected from the proposed Project fall within the type and range of impacts identified in the PEIS.

Construction activities could release air emissions of criteria pollutants, VOCs, GHGs (e.g., carbon dioxide [$CO_2$]), and small amounts of hazardous air pollutants (HAPs). During construction of Western's switchyard and the proposed Project, fugitive dust emissions would temporarily increase due to truck and

equipment traffic in the Project Area. Additionally, there would be short-term emissions from diesel trucks and construction equipment. Air quality effects caused by dust would be short-term, limited to the time of construction or decommissioning, and would not result in NAAQS exceedances or significantly contribute to GHG emissions.

There would be no direct air emissions from operating wind turbines, because no fossil fuels are combusted. Negligible amounts of dust, vehicle exhaust emissions, and combustion-related emissions from diesel emergency generators would occur during maintenance activities. These emissions would not cause exceedances of air quality standards or have any negative impacts on climate change. Operation of Western's switchyard and the Willow Creek Substation could produce minute amounts of ozone and nitrogen oxides emissions as a result of atmospheric interactions with the energized conductors. Impacts on ambient air quality from these minor emissions during operation would be negligible. The proposed switchyard and substation would employ sulfur hexafluoride-filled circuit breakers. Sulfur hexafluoride is a GHG, and, therefore, equipment leaks could contribute to air quality impacts. Equipment would undergo routine inspection and preventative maintenance to minimize such leaks, and if leaks did occur, the sulfur hexafluoride would be captured to prevent entering the atmosphere.

The Project could avoid considerable amounts of criteria pollutants, GHG, and HAP emissions that would otherwise have been generated from power plants burning fossil fuels. As discussed in Section 5.4.1.3 of the PEIS, operation of the Project could avoid from 4 percent up to 24 percent of air emissions from electric power systems in South Dakota, assuming the Project would displace fossil-fueled generation.

Implementation of the BMPs and conservation measures identified in Appendix D of this EA, derived from Section 5.4.2 of the EIS, would avoid or minimize potential impacts on air quality and climate associated with the Proposed Action.

No Project-related impacts on air quality or climate would occur with the No Action Alternative.

## 4.5 Noise Impacts

Section 5.5 of the Final UGP Wind Energy PEIS discusses the potential impacts on the acoustic environment resulting from wind energy projects in the UGP Region. The expected potential noise impacts of the proposed Project fall within the type and range of impacts identified in the PEIS.

Predicted Project sound levels from wind turbine operation were modeled using industry-accepted sound modeling software[2]. Wind turbine heights and acoustical emissions were input into the model. Because the switchyard does not have a transformer and, therefore, would not generate much noise, and because both the switchyard and substation would be located over 1 mile from the nearest residence and would not be audible at this distance, neither facility was included in the model.

Sound pressure levels were predicted for the nearest residence in the noise model using manufacturer-specified sound power levels. The maximum sound pressure predicted at the nearest residence is 43.3 dBA (Figure 4-1). As stated in Section 3.5, typical noise levels in rural areas range from 33 to 47 dBA. The predicted noise level is within this range. Furthermore, this noise level is less than the recommended 55 dBA in the South Dakota draft model wind ordinance. Therefore, adverse noise impacts would not be anticipated as a result of the Proposed Action.

Implementation of the BMPs and conservation measures identified in Appendix D of this EA, derived from Section 5.5.2 of the PEIS, would minimize noise impacts from the proposed Project.

With the No Action Alternative, there would be no Project-related noise impacts.

## 4.6 Ecological Resources

Direct and indirect impacts to ecological resources from wind energy development are discussed in detail in Section 5.6 of the Final UGP Wind Energy PEIS. Potential impacts to ecological resources expected from the proposed Project fall within the type and range of impacts identified in the PEIS. Implementation of the BMPs and mitigation measures identified in Appendix D of this EA, derived from Section 5.6.2 of the PEIS, would avoid or minimize impacts to ecological resources from the Proposed Action. No ecological resource impacts would occur as a result of the No Action Alternative.

### 4.6.1 Vegetation

The proposed Project would result in approximately 331 acres of temporary disturbance and 109 acres of permanent disturbance to vegetation. A third of the proposed turbines are sited on cropland or areas dominated by introduced grasses and forbs (see wildlife report in Appendix B). The remaining acreage of grassland is heavily impacted, mostly from high levels of grazing from domestic cattle. Western's switchyard would result in the permanent removal of 0.7 acre of grassland vegetation and temporary

[2] Computer Aided Design for Noise Abatement (CadnaA), Version 4.3.143, published by DataKustik, Ltd., Munich, Germany

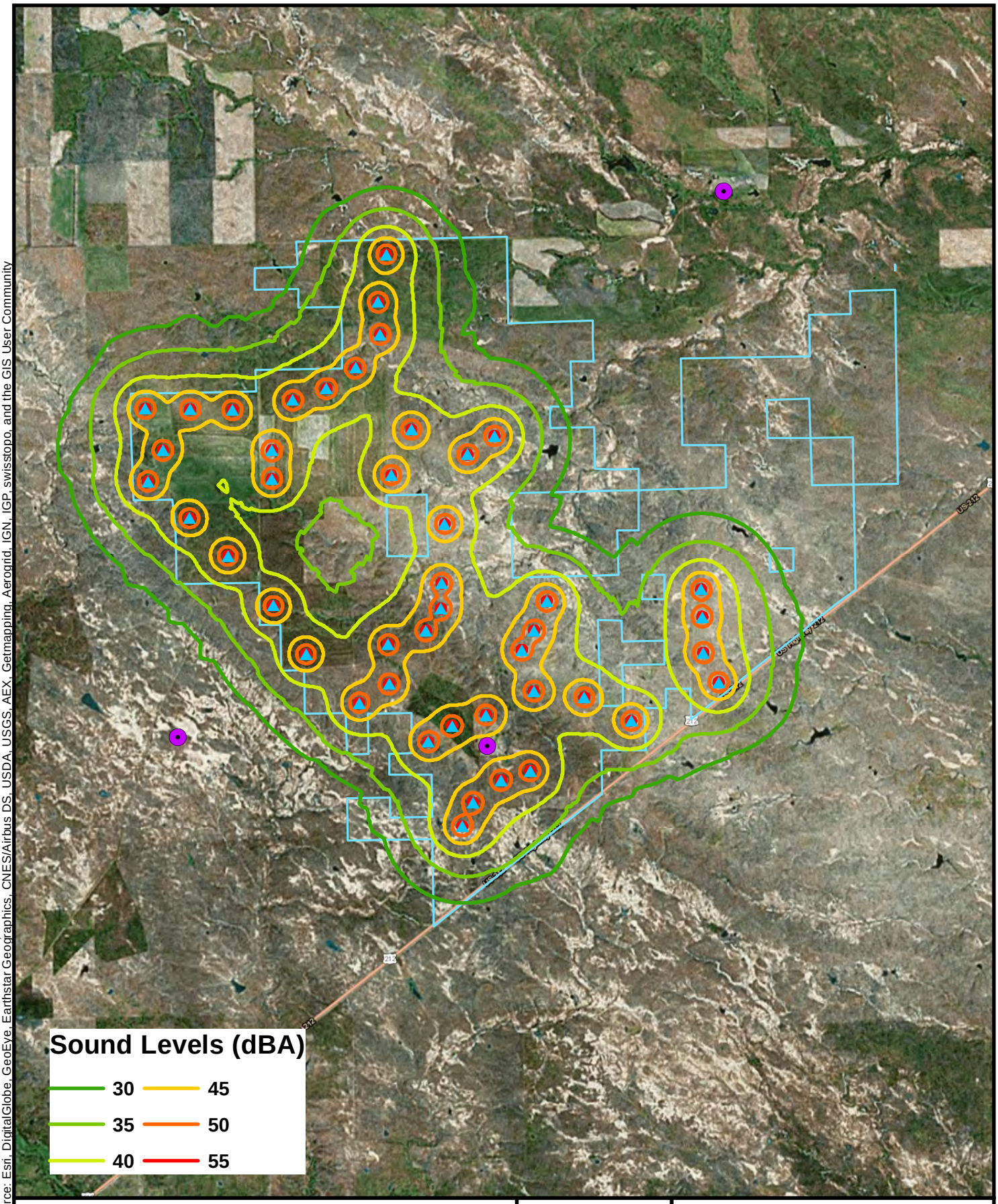


Figure 4-1
Predicted Sound Level Contours
Willow Creek Wind
Energy Facility
Environmental Assessment

BURNS McDONNELL

Source: ESRI; SDDOT; Burns & McDonnell Engineering; DNV-GL

Issued: 5/9/2016

disturbance of 1 acre of grassland vegetation. Turbines, access roads, collector lines, the collector substation, and Western's switchyard have been sited to avoid sensitive habitats. The Project would not involve any major tree clearing activities. Some minor clearing of brush may be required for collector lines and access roads. Impacts to vegetation would be minimized through the BMPs and conservation measures identified in Appendix D of this EA, derived from Section 5.6.2 of the PEIS.

The wind turbines, access roads, and collector system have been sited to avoid direct impacts to wetlands. Implementation of the BMPs and conservation measures identified in Appendix D, derived from Section 5.6.2 of the PEIS, would further protect wetlands during construction and operation of the Project.

### 4.6.2 Wildlife

Wildlife species richness, including vertebrates and invertebrates, observed in and adjacent to the Project Area was relatively low. One-hundred fifty-seven species of vertebrates, consisting of 5 amphibians, 8 reptiles, 118 birds, and 26 mammals, were observed during Project surveys (see wildlife report in Appendix B). Terrestrial wildlife species could be impacted at various spatial and temporal scales during the construction phase of the Project. Disruption of habitat and mortality could occur during the construction phase of the Project. Permanent habitat loss due to construction of wind turbines would be minimal across the Project Area and localized. Following construction, wildlife species are expected to habituate to routine facility operation and maintenance activities in a manner similar to relationships with existing ranching operations.

Ferruginous hawks and burrowing owls are the only raptor species documented to nest within the Project Area. To minimize spatial and temporal disturbance to nesting ferruginous hawks, Wind Quarry would avoid construction activity within a 1,600-meter buffer around active nests between March 15 and July 31 (FWS, 2015d). As planned turbine locations are far from known burrowing owl locations (black-tailed prairie dog colonies south of U.S. Highway 212), efforts to reduce impact to the nesting sites of this species are not necessary.

Acoustical surveys were conducted for the Project in 2014 and 2015 in two areas with habitat deemed most conducive to encountering bats (see wildlife report in Appendix B). The first site, located north and outside of the Project Area, consisted of a permanent open water site (North Fork Double R Creek) supporting various deciduous trees. During 2014, over 15,000 passes of bats were recorded and included the following species: long-eared myotis, fringed myotis, little brown bats, unidentified myotis species, big brown bats, and hoary bats. The second site was located within the Project Area and consisted of a shelterbelt of trees and shrubs. However, 129 nights of acoustical recording at this site in 2015 yielded

only 4 bat detections, 2 of which were likely long-eared myotis and 2 of an unidentified myotis species. Specific recommendations for reducing direct bat mortality associated with wind turbine operation would be implemented for the Project, as specified in the *Willow Creek Wind Project Wildlife Inventories and Bird and Bat Conservation Strategy* (Appendix B). With implementation of these measures, and given that bat abundance is low across the Project Area, the potential for the Project to impact bats is reduced. Furthermore, suitable roosting and foraging habitat is lacking in the Project Area. As discussed in Section 3.6.1, vegetation in the Project Area consists of grasslands with no substantial tree cover that would provide bat habitat.

Preliminary estimates of direct avian mortality are outlined in *Willow Creek Wind Project Wildlife Inventories and Bird and Bat Conservation Strategy* (Appendix B). The turbine design selected is tubular, reducing perching and nesting sites and, thereby, reducing risk of avian mortality. Upon deployment, a mortality monitoring program of at least 1 year would be instituted in consultation with FWS, Western, and SDGFP. Potential wildlife impacts resulting from the construction and operation of the substation and switchyard are expected to be negligible and related to the small permanent loss of habitat. Both facilities would be fenced with chain link fencing, which would keep many wildlife species out. The Project does not include construction of an overhead electric transmission line, and, therefore, no Project-related avian risks would result from avian interactions with electric transmission lines.

### 4.6.3 Aquatic Biota and Habitats

As described in Section 4.6.1, impacts to intermittent streams and wetlands have been avoided through siting of wind turbines, access roads, collector lines, and other Project facilities. The switchyard and substation would be located away from any wetlands or drainages, and would have runoff control features to comply with SWPPP requirements. The soils in the Project Area are not highly susceptible to erosion, and Wind Quarry has designed the Project to avoid steep slope areas. Implementation of BMPs and conservation measures identified in Appendix D, derived from Section 5.6.2 of the PEIS, would protect drainageways and streams from impacts by sediment runoff from exposed soils during precipitation events. Because erosion and sediment control would be in place for construction and operation of the Project, no impacts to aquatic ecosystems are expected as a result of the Project.

### 4.6.4 Threatened and Endangered Species

Potential direct and indirect effects to the whooping crane and northern long-eared bat from wind energy development in the UGP Region are analyzed in detail in Sections 5.5.6 and 5.6.6, respectively, of the UGP Wind Energy Programmatic BA. Detailed supplementary analysis of the direct and indirect effects of wind energy development on northern long-eared bats is provided in Section 4.6 of the Service's PBO

on the 4(d) rule for activities excepted from take prohibitions for the northern long-eared bat. Western has incorporated the PBO analysis by reference in this EA.

A programmatic ESA Section 7 consultation with the FWS has been completed for this proposed Project that is tiering off the Programmatic BA (Western and FWS, 2015b). The BA identified conservation measures for federally listed, candidate, or proposed species; those measures included programmatic BMPs and avoidance and minimization measures that would be required of project applicants during each phase of a wind energy project (i.e., site characterization, construction, operation, maintenance, and decommissioning). This information is provided within the Programmatic BA narrative for each species.

The Project would be in compliance with the requirements described in the Programmatic BA and the northern long-eared bat 4(d) rule. No northern long-eared bats were detected in the Project Area in pre-construction surveys. The Project Area is not currently affected by white nose syndrome, and there are no known hibernacula within 0.25 mile of the Project or roost trees within the Project Area. Wind Quarry would be required to verify this information annually with the FWS under the 4(d) rule.

Site-specific species and updated information for this Project are provided in *Willow Creek Wind Project Wildlife Inventories and Bird and Bat Conservation Strategy* (Appendix B). As discussed in the wildlife report and in Section 3.6.4 of this EA, suitable habitat for whooping crane and northern long-eared bats is minimal or lacking in the Project Area. No northern long-eared bats or whooping cranes were detected during surveys.

Wind Quarry has committed to implement all of the conservation measures identified in the Programmatic BA applicable to whooping crane and all of the conservation measures identified in the PBO for the northern long-eared bat. With implementation of these measures, Wind Quarry's proposed Project and Western's switchyard **may affect, but is not likely to adversely effect,** the whooping crane and northern long-eared bat.

For programmatic consultations that tier off of the PEIS, a Project Consistency Evaluation Form and individual Species Consistency Evaluation Forms (CEFs) have been developed for the listed, candidate, or proposed species that may occur within the UGP Region. The FWS has developed a similar form for projects consulting under the PBO for northern long-eared bats. The project and species forms are used as a tool for documenting and verifying that project proponents have complied with the requirements of the programmatic BA and are consistent with Tiers I, II, and III of the *U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines* (FWS 2012c). These forms that document agency verification (Western

and the FWS) that the proposed Project is in compliance with the Programmatic BA and 4(d) rule will be included in Appendix F of this EA.

### 4.6.5 Migratory Birds and Eagles

Wind Quarry completed Tiers I, II, and III of the *U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines* (FWS 2012c) to assess the potential adverse effects to migratory birds and eagles by the proposed Project. Results are presented in *Willow Creek Wind Project Wildlife Inventories and Bird and Bat Conservation Strategy* (Appendix B).

The Project is utilizing the streamlined programmatic process to expedite renewable energy production as outlined in the PEIS. As discussed in Section 4.4, the Project could avoid considerable amounts of GHG emissions that would otherwise have been generated from power plants burning fossil fuels. Climate impacts are the greatest long-term threat for the health of birds in the foreseeable future (Hoffman, 2013). A recent study examined data from all wind energy facilities currently in operation and found that 2.10 to 3.35 small birds per MW of installed capacity were killed annually (Erickson et al., 2014). Those mortality rates were much lower than the rates attributed to collisions with communication towers. Other human-related sources of bird deaths (e.g., buildings and domestic cats) have been estimated to kill millions to billions of birds each year (Erickson et al., 2014). Erickson et al. (2014) stated that the population-level effect for most small-passerine species may be smaller compared to other bird types, in part because they are shorter-lived and typically reproduce at a higher rate than other types of birds. Besides direct collision mortality, wildlife is indirectly affected by wind facilities through avoidance of turbines and related infrastructure (Drewitt and Langston, 2006). Shaffer and Buhl (2016) demonstrated that some grassland birds are displaced varying degrees for up to 5 years (study ended at 5 years), whereas, other species are not affected or are attracted to the turbines.

Wind Quarry moved the entire Project site once and eliminated almost half the new Project Area to avoid and minimize impacts to migratory birds and eagles. A third of the proposed turbines are sited on cropland or areas dominated by introduced grasses and forbs (see wildlife report in Appendix B). Remaining acreage of grassland is heavily impacted, primarily due to intensive livestock grazing. Therefore, the Project would not have significant effects on migratory grassland birds.

Wind Quarry has followed the voluntary FWS Eagle Conservation Plan Guidance (ECPG) (FWS, 2013) in evaluating and avoiding impacts to the local eagle population. Wind Quarry has demonstrated due diligence in avoiding and minimizing potential impacts to bald and golden eagles by re-siting the Project and then reducing the footprint of the Project Area away from eagle use areas. As outlined in the

ECPG, Stage 1, Stage 2, and Stage 3 of the guidance were completed and can be found in detail in Appendix B.

Existing data and Stage 2 surveys demonstrated low levels of use by bald and golden eagles in the Project Area and that the Project is not likely to take eagles. In assessing the likelihood that the Project will take eagles, this Project best fits an ECPG Category 3 – Minimal risk to eagles. A project is in this category if it:

- has no important eagle use areas or migration concentration sites within the project area;
- has an annual eagle fatality rate estimate of less than 0.03; and
- causes cumulative annual take of the local-area population of less than 5 percent of the estimated local-area population size.

## 4.7 Visual Resources

Section 5.7 of the PEIS describes potential visual impacts that could occur in the UGP Region from wind energy development. The potential visual impacts of the proposed Project would fall within the type and range of impacts identified in the PEIS. The primary direct visual impacts associated with the proposed Project would result from the introduction of the numerous vertical lines of the 45 wind turbines into the generally strongly horizontal landscape found in the Project Area.

As discussed in Section 3.7, viewers of the Project would include occupied residences within and adjacent to the Project Area, travelers along U.S. Highway 212, and hunters utilizing Walk-In Areas or private hunting leases. For these relatively few viewers, the magnitude of the visual impacts associated with the proposed Project would depend on many factors, including distance of the proposed wind energy facility from viewers, weather and lighting conditions, the presence and arrangements of lights on the turbines and other structures, and viewer attitudes. Viewer attitudes are very subjective, and their reactions to visual changes may be influenced by several non-visual factors, such as positions on renewable energy and wind power and on financial considerations. While the construction and operation of the proposed Project would result in a striking change to the visual landscape in the area, the introduction of the Project is not anticipated to be perceived as a major negative visual impact by most viewers in the Project Area.

As discussed in Section 3.7, the nearest scenic resources to the Project Area are Belle Fourche NWR to the west and Bear Butte to the south. The nearest proposed turbine location to Belle Fourche NWR would be approximately 20 miles, and the nearest turbine to Bear Butte would be approximately 26 miles. At these distances, visual impacts to these locations are not anticipated. Depending on topography and atmospheric conditions, the Project turbines could be viewed from these scenic resources. However, the

proposed Project would not cause large visual contrasts in the landscape at this distance and would not be noticeably visible, if visible at all.

Implementation of the BMPs and conservation measures identified in Appendix D, derived from Section 5.7.1.3 of the PEIS, would minimize visual impacts from the proposed Project.

With the No Action Alternative, there would be no Project-related visual changes in the Project Area.

## 4.8 Paleontological Resources

Section 5.8 of the Final UGP Wind Energy PEIS discusses the potential of wind energy development activities to impact paleontological resources in the UGP Region. Ground-disturbing activities, the majority of which take place during construction, represent the greatest impacting factor to paleontological resources. Based on the paleontological resource sensitivity (PFYC 4) of the geologic formations within the Project Area, the risk for impacts to paleontological resources from the Proposed Action is moderate. The construction of the turbine foundations would have the greatest potential to affect fossil-bearing formations. Foundations for substation equipment, while not nearly as deep, could also affect fossil-bearing formations at the substation and switchyard sites. While fossils are considered a non-renewable resource if they are impacted, it is also true that many important paleontological discoveries have been due to construction activities.

Implementation of the BMPs and conservation measures identified in Appendix D, derived from Section 5.8.1.6 of the PEIS, would minimize potential paleontological resource impacts.

No paleontological resource impacts would occur as a result of the No Action Alternative.

## 4.9 Cultural Resources

Section 5.9 of the PEIS describes the wind energy development activities with a potential to affect cultural resources. With implementation of the mitigation measures identified in Appendix D, derived from Section 5.9.1.6 of the PEIS, significant cultural resources in the Project Area would be identified and appropriately protected during Project development activities.

Wind Quarry would physically avoid NRHP-eligible properties and unevaluated properties, which are being treated as eligible for purpose of this Project, during Project construction and operation activities. Western would survey its switchyard site for cultural resources and will adjust the site location to avoid potentially eligible resources should any be found. If cultural resources were to be found during construction activities, all work would cease at that location and the notification and protection protocols

identified in Appendix D and Section 5.9.1.6 of the PEIS would be followed. As such, the proposed Project is not anticipated to adversely affect historic resources. In a letter dated February 3, 2016, SHPO concurred with this determination of **no adverse effect** for this Project (Appendix H). Additional cultural resources field investigations were conducted for the Project in March 2016 to assess the potential effects of modifications to some of the originally proposed turbine and access road locations. No cultural resources were located during this additional inventory, and in a letter dated June 28, 2016, SHPO concurred that the Project, as modified, would have **no adverse effect** on historic resources (Appendix H).

There would be no cultural resources impacts with the No Action Alternative.

## 4.10 Socioeconomics

The direct and indirect socioeconomic impacts produced from construction and operation of wind energy facilities in the UGP Region are described in Section 5.10 of the Final UGP Wind Energy PEIS. The anticipated short-term and long-term positive economic impacts associated with the proposed Project fall within the type and range of impacts identified in the PEIS. The peak number of construction jobs is expected to be approximately 200, with an average of approximately 125 over the duration of the construction phase. The National Renewable Energy Lab's (NREL's) Wind Energy Jobs and Economic Development Impact (JEDI) model calculates the construction phase local economic benefit to be approximately $4.2 million.

Only minor changes to population or employment are anticipated as a result of construction and operation of the proposed Project. Any increase in the local population would be temporary and limited to the construction phase. Wind Quarry anticipates that there would not be sufficient trained local labor to fill the number of jobs available. The majority of the non-local construction workforce would probably be located within a 55-mile radius that would include Rapid City and could commute to the Project Area without the need for additional temporary or permanent housing at the Project Area.

Construction and operation of the Project would create long-term beneficial impacts to Butte County's tax base for the life of the Project. The county would also benefit from increased revenues generated from permits and fees during the construction phase. These increased revenues could be used to improve local government or community services, benefitting all local residents. Local spending during the construction and operations periods would result in additional personal income, as well as increased State and local taxes. Landowners who participate in the Project would receive the most direct economic benefit from lease payments for wind turbines and roads located on their property. These payments would provide a

predictable supplementary source of income and could be a significant benefit during times of adverse weather or other factors that could negatively impact their ranching operations.

Construction activities for the Project would be short-term, and any short-term effects to local businesses would most likely be beneficial. No negative long-term impact to the socioeconomics of the Project Area would be expected, and no adverse effects on the industrial sector, housing, labor market, health facilities, water and sewer systems, existing energy facilities, solid waste facilities, schools, fire protection, law enforcement, or other community, government, or recreational facilities would be anticipated.

The Project would generate approximately six long-term jobs, which would have a positive effect on local income levels. These long-term positions include an O&M supervisor, a lead wind technician, and several wind technicians. Employee salaries and benefits are expected to be approximately $300,000 total annually, plus approximately 40 percent for benefits. Salaries are expected to increase by approximately 3 percent annually for cost of living. The Project would have no impact on population or overall occupation distribution in the Project Area.

The No Action Alternative would not result in new jobs for construction or operation of the Project. It would also not result in new tax revenue for Butte County.

## 4.11 Environmental Justice

As determined in Section 3.11, no minority or low-income populations have been identified, and, thus, no disproportionately high and adverse human health or environmental effects are expected from the proposed Project. Therefore, in accordance with the provisions of EO 12898, no further environmental justice analysis is required for either the Proposed Action or No Action Alternative.

## 4.12 Hazardous Materials and Waste

Section 5.12 of the Final UGP Wind Energy PEIS discusses the possible adverse impacts resulting from the presence and use of hazardous materials and the generation, management, and disposal of wastes. With the proposed Project, Wind Quarry would implement the appropriate mitigation strategies identified in Section 5.12.1.4 of the PEIS to eliminate or reduce adverse impacts from Project-related hazardous materials and wastes. Section 3.9 of the PEIS provides a discussion of the amounts and types of hazardous materials that would be present at a wind farm during its construction, operation, and decommissioning phases. These same amounts and types of hazardous materials would also be anticipated for the Willow Creek Wind Farm. There would be no Project-related hazardous materials impacts with the No Action Alternative.

## 4.13 Health and Safety

Health and safety concerns of wind energy development are discussed in Section 5.13 of the PEIS. Wind Quarry would implement the BMPs and conservation measures identified in Appendix D, derived from Section 5.13.4 of the PEIS, for protection of wind energy facility and transmission line workers and for the protection of public health and safety during the various phases of Project development associated with the proposed Project.

As indicated in Section 5.13.3 of the PEIS, Wind Quarry is responsible for ensuring the operability and reliability of their systems. To do so, they must evaluate the potential risks from all credible events, including natural disasters (earthquakes, storms, etc.) as well as mechanical failure, human error, sabotage, cyber-attack, or deliberate destructive acts, recognizing intrinsic system vulnerabilities, the realistic potential for each event/threat, and the potential consequences. The proposed Project is not anticipated to be at any unusual risk for accidents or acts of sabotage or terrorism.

There would be no Project-related health or safety concerns with the No Action Alternative.

# 5.0 CUMULATIVE IMPACTS

The cumulative impacts of past, present, and future actions on resources within the UGP Region are analyzed in Section 6 of the UGP Wind Energy Final PEIS. The contribution of cumulative impacts associated with the proposed Project falls within the scope of the cumulative impacts analysis in the PEIS. The PEIS (Section 2.4) projected wind energy development through the year 2030 for the UGP Region, and the proposed Project is part of that projected development. Other wind development projects in the UGP Region within approximately 150 miles of the Project Area include three Montana-Dakota Utilities (MDU) wind farms currently in operation, one wind farm under construction, and one currently proposed for construction. These wind farms consist of:

- MDU's 108-MW Thunder Spirit Wind Farm near Hettinger, North Dakota, approximately 80 miles northeast of the Project Area
- MDU's 30-MW Diamond Willow Wind Farm near Baker, Montana, approximately 110 miles northwest of the Project Area
- MDU's 20-MW Cedar Hills Wind Farm near Rhame, North Dakota, approximately 100 miles north of the Project Area
- 110-MW Sunflower Wind Energy Project near Hebron, North Dakota, approximately 140 miles northeast of the Project Area (under construction)
- 150-MW Brady Wind Energy Center in Stark County, North Dakota, approximately 120 miles north of the Project Area (proposed)

The construction and operation of the proposed Project, in combination with these other existing and proposed wind farms, as well as other private and public development occurring within 150 miles of the Project Area, could contribute to cumulative impacts on resources within the UGP Region. A summary of cumulative impacts analyzed for each resource area under the PEIS's preferred alternative (of which this proposed Project is a part) is provided in Table 6.3-2 of the PEIS. Over the long term, the most significant potential impacts would be to ecological and visual resources. However, as discussed in this EA, impacts to local ecological and visual resources have been avoided or minimized during the siting and design of the Project. Furthermore, implementation of the programmatic BMPs and conservation measures from the PEIS, identified in Appendix D of this EA, would minimize potential impacts of the Project on all resources. Therefore, the incremental contribution of the proposed Project to cumulative impacts on resources within the region would be negligible.

# 6.0 COORDINATION

A public scoping meeting was held on July 8, 2015, in Newell, South Dakota. Federal, State, and local agencies were invited to the meeting and to provide comments regarding the proposed Project. The general public was invited through newspaper and radio announcements, and residents near the Project were invited to comment. The public scoping meeting documentation is included in Appendix G. Comments received regarding the proposed Project from agencies and the public are included in Appendix H.

## 6.1 Federal Agencies

The Federal agencies that were contacted for the purpose of the EA scoping process are:

- Advisory Council on Historic Preservation
- Bureau of Land Management
- Farm Service Agency
- Federal Aviation Administration
- Federal Emergency Management Agency
- Federal Energy Regulatory Commission
- Federal Highway Administration
- National Park Service
- Natural Resources Conservation Service
- Rural Utilities Service
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture
- U.S. Department of the Interior
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- U.S. House of Representatives
- U.S. Senate

## 6.2 State and Local Agencies

The State and local agencies that were contacted for the purpose of the EA scoping process are:

- Office of the Governor

- Governor's Office of Economic Development
- Butte County Conservation District
- South Dakota Department of Agriculture
- South Dakota Department of Environment and Natural Resources
- South Dakota Department of Transportation
- South Dakota Game, Fish and Parks Department
- South Dakota House of Representative
- South Dakota Senate
- South Dakota Public Service Commission
- South Dakota School and Public Lands
- South Dakota State Historical Society
- Butte County Commission
- City of Newell
- Newell School District

## 6.3 Native American Tribes and Associated Bodies

Pursuant to NEPA and Section 106 of the NHPA, Native American tribes that may attach religious and cultural significance to historic properties within the Project Area were contacted and invited to participate in the NEPA scoping and Section 106 consultation process.

The following 25 tribes were contacted in June and July 2015: the Cheyenne and Arapaho Tribes of Oklahoma; Cheyenne River Sioux Tribe; Crow Creek Sioux Tribe; Crow Tribe of Indians; Eastern Shoshone; Flandreau Santee Sioux Tribe; Ft. Peck Assiniboine and Sioux Tribes; Lower Brule Sioux Tribe; Lower Sioux Indian Community; Northern Arapaho Tribe; Northern Cheyenne Tribe; Oglala Sioux Tribe; Prairie Island Indian Community; Rosebud Sioux Tribe; Sac and Fox Nation; Sac and Fox Nation of Missouri; Sac and Fox Tribe of Mississippi; Santee Sioux Tribe; Spirit Lake Tribe; Sisseton-Wahpeton Dakota Nation; Standing Rock Sioux Tribe; Three Affiliated Tribes of the Fort Berthold Reservation; Turtle Mountain Band of Chippewa; Upper Sioux Indian Community; and Yankton Sioux Tribe.

Only one tribe, the Santee Sioux, responded and accepted Western's invitation to participate in the Section 106 consultation process (email from Rick Thomas, July 20, 2015). Western responded that same day acknowledging the Santee's participation and asked if the tribe had any concerns or general information regarding properties of traditional religious or cultural importance that Western should consider as part of the undertaking. The tribe did not respond to Western's request for information.

On July 28, 2015, the Oglala Sioux (email from Loni Weston cc to Dennis Yellow Thunder) requested participation in monitoring [during cultural resources survey]. On July 29, 2015, Western forwarded the tribe's request on to Wind Quarry to make arrangements for monitoring; however, their request came too late and the survey was already completed. That same day, Western responded to the Oglala asking again if the tribe was interested in participating in the Section 106 consultation process. Although the tribe did not respond to Western's question, Western assumed the tribe's interest.

Representatives of the Cheyenne River Sioux, Northern Cheyenne, Santee Sioux, and Standing Rock Sioux Tribes all participated in the cultural resources survey, site recording, interpretation, and NRHP evaluations. On October 15, 2015, Western (via email) contacted these tribes and the Oglala Sioux stating that the cultural resources survey report would be available for review and comment in the next few weeks. None of the tribes acknowledged the email. On November 9, 2015, these tribes were provided a copy of the cultural resources survey report for review and comment (Enclosure 3), as well as comment on NRHP eligibility and Project effect findings. None of the tribes provided comments.

## 6.4 Non-Governmental Organizations

Non-governmental organizations have been contacted to participate in the EA scoping process. The non-governmental organizations that were contacted for the purpose of the EA scoping process are:

- American Bird Observatory
- Ducks Unlimited
- Isaak Walton League of America
- Pheasants Forever
- Prairie Hills Audubon Society
- Sierra Club
- The Nature Conservancy

# 7.0 LIST OF PREPARERS

Table 7-1 identifies the personnel responsible for the preparation of this EA.

**Table 7-1: List of EA Preparers**

| Name | Agency/Firm | Title | Education/Experience |
|---|---|---|---|
| Louis Hanebury | Western | UGP Environmental Protection Specialist | |
| Matthew Marsh | Western | UGP Environmental Manager | |
| Lisa Meyer | Western | Historic Preservation Specialist | |
| Micah Reuber | Western | UGP NEPA Coordinator | |
| Mark Wieringa | Western | Environmental Protection Specialist | |
| John O'Meara | Wind Quarry | Chief Operating Officer | B.S. Chemistry; 8 years of experience in wind energy development |
| Patrick O'Meara | Wind Quarry | Chief Executive Officer | B.S. Biology; M.S. Biology; Doctor of Osteopathic Medicine; 8 years of experience in wind energy development |
| James Tomsic | Wind Quarry | Electrical Engineer | B.S. Electrical Engineering/Computer Science; 30 years of experience in transmission planning, engineering, operations, and maintenance |
| Paul Callahan | Burns & McDonnell | NEPA Project Manager | M.S. Forestry; B.S. Chemistry; 25 years of experience in natural resource management and NEPA compliance |
| Jennifer Bell | Burns & McDonnell | Senior NEPA Specialist | M.U.R.P. (Master of Urban and Regional Planning); B.S. Environmental Science; 9 years of experience in NEPA compliance |
| Samantha Clark | Burns & McDonnell | Biologist | B.A. in Biology; 24 years of experience in ecological resource analysis |

| Name | Agency/Firm | Title | Education/Experience |
|---|---|---|---|
| Emily Robbins | Burns & McDonnell | Noise Specialist | M.S. Environmental Engineering; B.S. Civil Engineering; 3 years of experience in air quality and noise analysis |
| Brian Parker | Burns & McDonnell | GIS Analyst | M.L.A. Landscape Architecture; B.S. Interdisciplinary Studies; 14 years of experience in GIS mapping and analysis |
| Eric Atkinson | Marmot's Edge Conservation | Wildlife Biologist | B.S. Zoology; M.S. Raptor Biology; 23 years of experience in wildlife biology |
| Lance Rom | Quality Services, Inc. | Cultural Resource Specialist | B.A. Anthropology and Geology; M.A. Anthropology and Public Archaeology; 41 years of experience in archaeology and Section 106 compliance |

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# APPENDIX A - WIND TURBINE CHARACTERISTICS

**Wind Turbine Characteristics**

| | **Siemens 2.3-MW** |
|---|---|
| Rated output | 2.3 megawatts |
| Tower height | 262 feet |
| Rotor diameter | 354 feet |
| Total height | 440 feet |
| Cut-in wind speed[a] | 7 to 9 miles per hour |
| Rated capacity wind speed[b] | 25 to 27 miles per hour |
| Cut-out wind speed[c] | 56 miles per hour |
| Maximum sustained wind speed[d] | 133 miles per hour |
| Rotor speed | 6 to 16 revolutions per minute |
| Total number of turbines (maximum) | 45 |

(a) Cut-in wind speed = wind speed at which turbine begins operation
(b) Rated capacity wind speed = wind speed at which turbine reaches its rated capacity
(c) Cut-out wind speed (600 second average) = wind speed above which turbine shuts down operation
(d) Maximum sustained wind speed – wind speed up to which turbine is designed to withstand

# APPENDIX B - WILDLIFE REPORT AND BIRD AND BAT CONSERVATION STRATEGY

# WILLOW CREEK WIND PROJECT
# WILDLIFE INVENTORIES
# AND
# BIRD AND BAT CONSERVATION STRATEGY

20 December 2015

Butte County, South Dakota

Prepared for

Wind Quarry, LLC
PO Box 2055
Montrose, CO 81402

Prepared by

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Marmot's Edge Conservation
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Willow Creek Wind Project Part A: Wildlife Inventories

# *Willow Creek Wind Project*
# *Part A: Wildlife Inventories*

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Butte County, South Dakota
27 September 2015

# INTRODUCTION & BACKGROUND INFORMATION

The proposed Willow Creek Wind Project (heretofore the Project) is a large (103 MW) wind power project proposed for Butte County, South Dakota. The project is currently under review by SD Public Utilities Commission.

If permitted, the Project will comprise construction of approximately 45 three-bladed, horizontal-axis 2.3-MW (likely, Siemens SWT-2.3-108) wind turbines with a total nameplate capacity equal to 103 MW. The turbines would have a rotor diameter of approximately 108 meters and a rotor speed of 6 to 16 revolutions per minute (rpm). The cut-in speed is 4.0 meters per second (8.9 miles per hour [mph]) and the cut-out speed is 25 meters per second (55 mph). The towers would be constructed of tubular steel with a hub height of approximately 80 meters (262.5 feet). Project substations, collector and feeder lines, an operation and maintenance (O&M) facility, one or two permanent meteorological towers, associated access roads and a new approximately four-mile 69 kV transmission line would also be needed (L15-020 – In the Matter of the Application by Wind Quarry Operations, LLC, for a Wind Energy Facility Permit for the Willow Creek Wind Energy Facility and Associated Facilities. http://www.puc.sd.gov/Dockets/Electric/2015/el15-020.aspx accessed 22 July 2015).

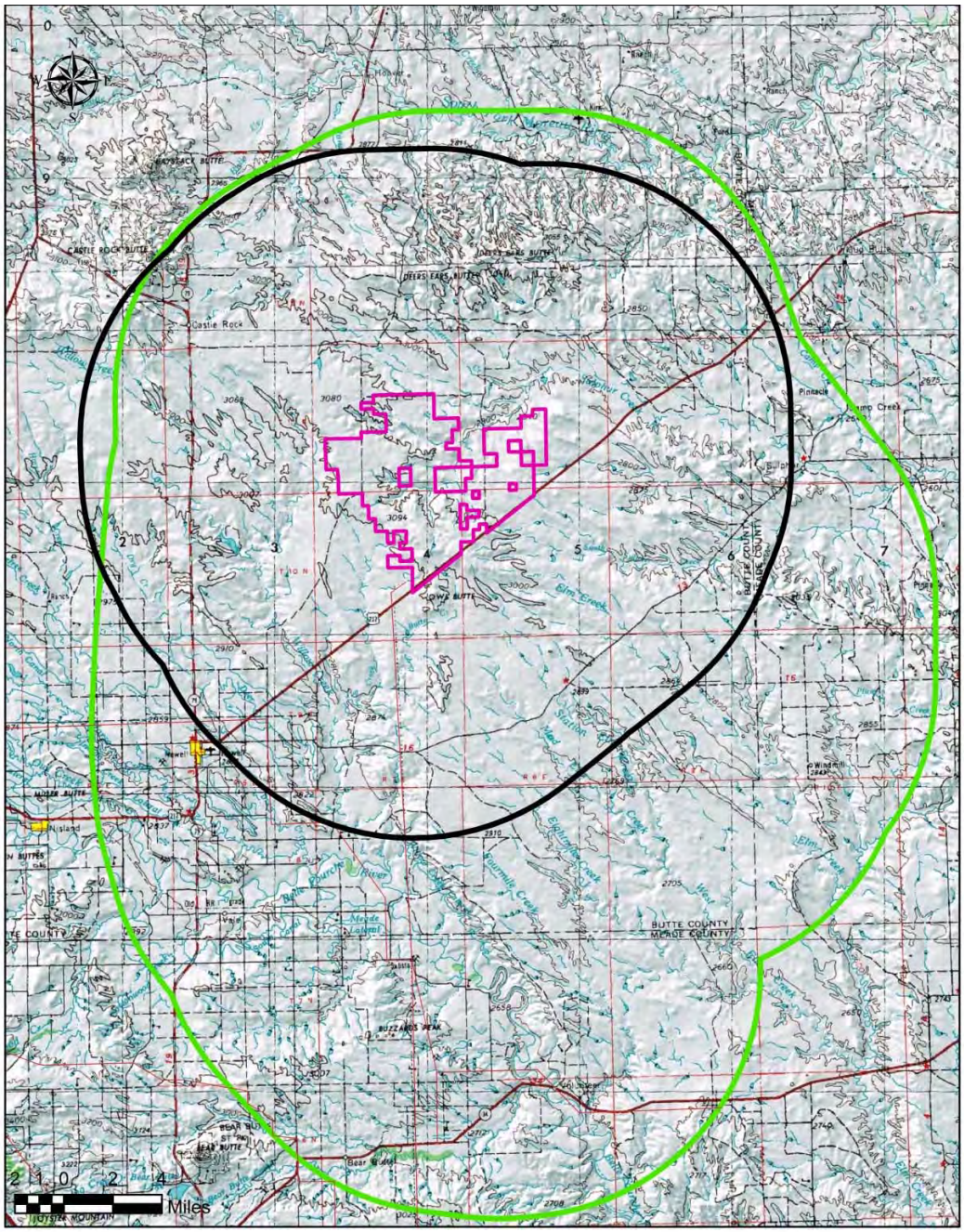
Throughout this report, several terms are used to describe areas surveyed for wildlife. Early survey work, beginning in 2011, was based on the upon a ROW (SDM 101182) application submitted to the Bureau of Land Management (Atkinson 2011). Initially, surveys were centered in an area surrounding BLM holdings in Townships 8N and 9N Range 7E. For this, and subsequent potential project areas, a 10 mile (16 km) buffer area served as the surveyable area for raptor nests, including those of Bald Eagle (*Haliaeetus leucocephalus*) and Golden Eagles (*Aquila chrysaetos*). This eagle-oriented survey area is known throughout this report as the Project Buffer-Initial comprising approximately 470,762 acres (190,511 ha). As the project planning matured the Project footprint (heretofore known as the Project Area) was moved approximately to the northeast with the original southwestern margin retained and expansion extended to the northeast resulting in a Project Buffer-Final encompassing 774,537 acres (313,444 ha). Over the course of 2011-2013, Wind Quarry LLC, adjusted the location and size of the area encompassing the project as information was collected. Hence, by autumn 2013, the Project Area comprised approximately 45000 acres (18210 ha) and had been relocated to the northeast to increase the distance from Bear Butte State Park and the Belle Fourche River. To adequately assess the Project Area in the context of the surrounding lands, we defined as an area of interest of approximately 140770 acres (56992 ha) surrounding the proposed project footprint. By early 2015, in response to the identification of nesting Bald Eagles and Golden Eagles along the Belle Fourche River and to the north of the potential project, coupled with efforts to avoid active black-tailed prairie dog colonies and areas of high raptor abundance, Wind Quarry LLC. adaptively moved the intended Project Area to an area north of Highway 212. This area encompasses approximately 9500 ha (23,500 acres) upon this writing and heretofore is acknowledged as the working Project Area (Figure 1).

Wind Quarry, LLC is committed to good stewardship of the environment as well as meeting regulatory requirements. As part of responsible development Wind Quarry, LLC has developed this report to describe both inventory methods and efforts as well as to provide natural history

background necessary for a Bird and Bat Conservation Strategy (BBCS) under the *Land-Based Wind Energy Guidelines* (USFWS 2012) and *Eagle Conservation Plan Guidance Module 1 – Land-based Wind Energy Version 2* (USFWS 2013), respectively. This report is the culmination of four years of coordination with state and federal agencies including the South Dakota Game, Fish and Parks Department (SDGFP), USDI Bureau of Land Management (BLM), US Fish and Wildlife Service (USFWS), and the Western Area Power Administration (WAPA), as well as field surveys extending back to 2011. Coordination included ongoing telephone and email coordination, multiple meetings and/or conference calls between parties extending back to 2008 (P. O'Meara, personal communication).

During 2011, that summer's cursory survey began laying groundwork necessary for adequate assessment of wind power development upon natural resources (SDGFP no date) following guidelines published in USFWS Wind Energy Guidelines (heretofore WEG, 2011) while also beginning data gathering necessary for the production of an Eagle Conservation Plan (ECP). As this assessment began to progress, the USFWS was simultaneously developing Eagle Conservation Plan Guidance (heretofore ECP; USFWS 2013), discussions with agency personnel were entered into and data collected were to contribute to the Tiers 1 and 2 of the WEG and Stage 1 of the ECP. Due to low occurrences and calculated fatality risk to eagles, an ECP is no longer planned to be produced. However, a Bird and Bat Conservation Strategy [formerly called Avian and Bat Protection Plans (ABPP)] will be produced describing the calculation of eagle fatality risks leading with specific recommendations for reducing and mitigating negative effects on eagles, in addition to other birds and bats.

**Figure 1. Location of Willow Creek Wind Power Project, Wind Quarry, LLC [Scale 1:346,525]**

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The Project Area lies in Butte County north of the Belle Fourche River and is characterized as dense clay prairie (43k) level IV ecoregion of South Dakota (US EPA 2011). Vegetation communities in this ecoregion are generally very simple, composed largely of western wheatgrass (*Pascopyrum smithii*) stands showing very low understory cover; bare ground cover can be substantial. The area is semi-arid with 13-15 inches of annual precipitation (Bryce *et al*. 1998). Coupled with low precipitation and the simple habitat structure (i.e., trees are rare, as are shrubs) vertebrate species richness and diversity are likely low (Tews *et al*. 2004). These monotypic native stands are susceptible to surface disturbance and erosion, leading managers to be cognizant of this feature. Topography is simple with the area comprising rolling hills and shallow drainages leading southward toward the Belle Fourche River. Certain areas along the north and west of the Project Area have been converted to alfalfa (*Medicago sativa*) and alfalfa/grass mixtures for hay whereas other sites have been reclaimed to grasslands largely dominated by grasses including intermediate wheatgrass (*Thinopyrum intermedium*), smooth brome (*Bromus inermis*), western wheatgrass, and some orchard grass (*Dactylis glomerata*) mixed with alfalfa. Western wheatgrass dominated grasslands comprise approximately 74% of the Project Area (7022 hectares ; 17,352 acres) whereas introduced tame grasslands commixed with alfalfa dominate approximately 25% (2347 ha; 5800 ac). Wetlands account for approximately 0.02% (141 ha; 348 ac)of the project area as 121 scattered generally seasonal or temporary impoundments.

## Wildlife

Wildlife species inhabiting the dense clay prairies are typical of semi-arid grasslands of the western Great Plains with pronghorn (*Antilocapra americana*) as the primary native ungulate. Mule deer (*Odocoileus hemionus*) are present where woody cover is available, although this feature is rare in the ecoregion. Predators including coyotes (*Canis latrans*), swift foxes (*Vulpes velox*), red foxes (*V. vulpes*), and American badgers (*Taxidea taxus*) can be encountered in these habitats. Where cover is available, one would expect to encounter sign of wild felids such as bobcat and mountain lions, especially those of dispersing individuals.

Birds characteristic of prairie landscapes with light to moderate ground cover and little downed and/or standing litter include Sharp-tailed Grouse (*Tympanuchus phasianellus*), Ferruginous Hawks (*Buteo regalis*), Long-billed Curlews (*Numenius americanus*), Lark Buntings (*Calamospiza melanocorys*), Grasshopper Sparrows (*Ammodramus savannarum*), Chestnut-collared Longspurs (*Calcarius ornatus*), and Western Meadowlarks (*Sturnella neglecta*) (Tallman *et al*. 2002). Golden Eagles (*Aquila chrysaetos*) forage across the Project Area and nest to north and south.

Reptiles and amphibians may be locally abundant in suitable microsites (i.e., stock water impoundments or ephemeral streams) and include bullsnakes (*Pituophis catenifer*), prairie rattlesnakes (*Crotalus viridus*), plains garter snakes (*Thamnophis radix*), Great Plains toads (*Anaxyrus* (*Bufo) cognatus*), and tiger salamanders (*Ambystoma tigrinum*) but overall densities are low.

Element Occurrence Records provided by the Wildlife Diversity Program - SD Dept.of Game, Fish and Parks dated 15 August 2011 indicate no occurrences of state sensitive or tracked

invertebrate and/or vertebrate species within the Project Area. A second request for the Project Buffer-Final was retrieved 22 July 2015.

General wildlife surveys were initiated by Marmot's Edge Conservation in 2011 and continued through the close of 2014. These surveys included specific and targeted assessments designed to produce accurate and reliable estimates of a) migratory bird use of the area; b) raptor distribution, behavior (i.e., flight heights), and nesting within and adjacent to the Project Area; c) bat diversity near water bodies; d) upland game bird distribution and lek locations; e) landbird diversity and relative abundance; e) amphibian and reptile occurrence; and f) mammal occurrence. The following procedures were employed as general wildlife and taxon specific procedures: vehicle, pedestrian, aerial (helicopter), 20-minute and 60-minute raptor point counts, 4-hour raptor migration counts, 10-minute passerine point counts, amphibian and reptile visual encounter surveys (VES), active and passive acoustical bat monitoring, and nocturnal spotlight transects. In addition to surveys deployed within the resultant Project Area, inventories were also performed in a 16 km (10 mile) buffer zone surrounding the Project Area. Hence, when species were encountered within the demarcated Project Area, it has been so noted.

Wildlife species may be impacted by wind power development in a variety of manners including direct mortality, habitat disturbance during construction and operation, landscape fragmentation, and through changing the vertical structure of historically, somewhat two-dimensional habitats (see references in Strickland *et al*. 2011). Big game and prairie grouse are thought to be especially sensitive to changes in the vertical structure of open habitats and may experience displacement during development and implementation of wind projects. Raptors, passerines, and bats can be negatively impacted through direct mortality associated with collision with turbine blades or through barotrauma in the case of bats (Baerwald *et al*. 2008). At the Willow Creek Wind Project, species for which these various impacts may be experienced include BLM Sensitive Species including Swainson's Hawks (*Buteo swainsoni*), Ferruginous Hawks, Golden Eagles, Long-billed Curlews, Burrowing Owls (*Athene cunicularia*), Sprague's Pipits (*Anthus spragueii*), Chestnut-collared Longspurs, Dickcissels (*Spiza americana*), Loggerhead Shrikes (*Lanius ludovicianus*), black-tailed prairie dogs (*Cynomys ludovicianus*), and swift foxes (Atkinson 2011). Furthermore, Bald Eagles are known to occur adjacent to the Project Area both during winter and during migratory periods (SD Wildlife Diversity Program unpubl. data). Heretofore, the bat community occupying the Project Area is unknown and breeding habitats are limited (Atkinson 2011).

Hence, this report strives to integrate abundance, distribution, and habitat affinities of wildlife across the Willow Creek Project with specific attention paid to raptors, including both Golden Eagles and Bald Eagles; Rare, Sensitive, Threatened, and Endangered Species both federally and state-recognized; upland game birds, including Sharp-tailed Grouse and Greater Sage-Grouse (*Centrocercus urophasianus*); bats; big game; predators; and prairie passerines while assessing potential impact to these resources by the development of a wind power facility. At this stage, estimates of eagle mortality cannot yet be accurately predicted but locations of raptor nests, including those of both Bald and Golden Eagle are presented. These data types contribute to the development of early Tier 2 of the WEG and Stage 1 of ECP.

## Migratory Birds

The Project Area lies within the Central Flyway funneling waterfowl and other species between the Gulf Coast and northern breeding grounds. Furthermore, the project is contained with Bird

Conservation Region (BCR) 17 (American Bird Conservancy 2015). Substantial movements of migratory birds including waterfowl, Sandhill Cranes (*Grus canadensis*), raptors, and passerines occur across the area in both vernal and autumnal periods. However, little migratory stopover habitat is provided in the Project Area. Deciduous draws are not present, wetlands are largely anthropogenic in the form of livestock watering ponds with little exposed shorelines, and the little topographical relief present fails to funnel migrants through the area in any concentrated manner. Heretofore, no cereal grains are raised within or near to the Project Area with alfalfa and mixed grass haying operations and livestock grazing contributing the only agricultural uses. Hence, no strong attractants such as cereal grain fields are provided for migratory avian species.

Migratory waterfowl including dabbling and diving ducks cross the area but few water bodies are present or ice-free during spring migration. Areas to the west provide higher quality foraging stops and include Belle Fourche Reservoir and Newell Lake for these birds. Sandhill Cranes migrate over the Project Area in the spring but generally at high altitudes (mean height = 313 m, SE = 71.8 m at initial observation as flocks gained altitude until out of sight across the Project Area).

### Raptors

Across the Project Area and within a 10-mile (16 km) buffer zone surrounding the Project Area, raptor seasonal and spatial distribution, abundance, and species richness were assessed through vehicle, pedestrian, and aerial (helicopter) surveys between 2011 and 2014 (Atkinson 2011, 2014). Additionally, 20-minute and 60-minute raptor point count surveys well distributed across the area characterized distribution, seasonal timing, abundance, and behavior of raptors. Four-hour migration counts described broad local broad front migration of boreal and temperate species.

Raptor species encountered within the buffer zone and Project Area include approximately 20 species (Table A-1).

**Table A-1. Raptor Species Encountered within the Project Buffer-Initial and Project Buffer-Final Areas; 2011-2015**

| Common Name | Scientific Name |
|---|---|
| Turkey Vulture | *Cathartes aura* |
| Northern Harrier | *Circus cyaneus* |
| Sharp-shinned Hawk | *Accipiter striatus* |
| Cooper's Hawk | *Accipiter cooperii* |
| Broad-winged Hawk | *Buteo platypterus* |
| Swainson's Hawk | *Buteo swainsoni* |
| Red-tailed Hawk | *Buteo jamaicensis* |
| Ferruginous Hawk | *Buteo regalis* |
| Rough-legged Hawk | *Buteo lagopus* |
| Golden Eagle | *Aquila chrysaetos* |

| | |
|---|---|
| Bald Eagle | *Haliaeetus leucocephalus* |
| American Kestrel | *Falco sparverius* |
| Merlin | *Falco columbarius* |
| Peregrine Falcon | *Falco peregrinus* |
| Prairie Falcon | *Falco mexicanus* |
| Short-eared Owl | *Asio flammeus* |
| Great Horned Owl | *Bubo virginianus* |
| Snowy Owl | *Bubo scandiacus* |
| Burrowing Owl | *Athena cunicularia* |

## Bats

Bat mortality associated with wind power installations has recently been of concern (Kunz *et al*. 2007). Bats may be killed directly through impact by rotors but recent studies have suggested that barotrauma may be a strong factor leading to the death of flying bats (Kunz *et al*. 2007, Arnett *et al*. 2008, Baerwald *et al*. 2008). Few studies exist in western South Dakota documenting such mortality or basic habitat and distributional information (Tigner and Stukel 2003, SDGFP unpubl. data 2012, 80 FR 17973 18033). Species occurring in South Dakota and potentially in the Project Area include approximately 13 species (Table A-2, South Dakota Bat Working Group 2004):

**Table A-2. Bats Occurring in South Dakota with Level of Potential Presence in the Project Area**

| Common Name | Scientific Name | Project Area | Residency |
|---|---|---|---|
| Big Brown Bat | *Eptesicus fuscus* | Yes | Year-round |
| Eastern Red Bat | *Lasiurus borealis* | Not likely | Summer |
| Evening Bat | *Nycticeius humeralis* | Potential | Migratory |
| Fringed Myotis | *Myotis thysanodes* | Likely | Year-round |
| Little Brown Myotis | *Myotis lucifugus* | Yes | Year-round |
| Long-eared Myotis | *Myotis volans* | Likely | Year-round |
| Northern Long-eared Myotis | *Myotis septentrionalis* | Not likely | Year-round |
| Western Small-footed Myotis | *Myotis ciliolabrum* | Likely | Year-round |
| Hoary Bat | *Lasiurus cinereus* | Yes | Summer |
| Silver-haired bat | *Lasionycteris noctivagans* | Not likely | Summer |
| Townsend's Big-eared Bat | *Corynorhinus townsendii* | Potential | Year-round |
| Eastern Pipistrelle | *Perimyotis* (*Pipistrellus*) *subflavus* | Not likely | Year-round |

## Sensitive Terrestrial Species

The following federally listed Threatened and/or Endangered Species (USFWS 2015a) could potentially occur in the Project Area and surveys for these species were performed if warranted by presence of suitable habitat: Greater Sage Grouse (*Centrocercus urophasianus*), Red Knot (*Calidris canutus rufa*), Sprague's Pipit (*Anthus spragueii*), Whooping Crane (*Grus americana*) and Northern Long-eared Bat (*Myotis septentrionalis*),

## Greater Sage-Grouse

The Greater Sage-grouse formerly was a Candidate Species under the Endangered Species Act (USFWS 2015a) but was determined to not warrant protection in October 2015 (80 FR 59858 59942, https://federalregister.gov/a/2015-24292). A large gallinaceous bird, this grouse was historically tied to great swaths of big sagebrush (*Artemisia tridentata*) throughout much of the western United States and parts of Canada (Connelly *et al*. 2004). Once abundant, sage-grouse populations have experienced dramatic declines since EuroAmerican settlement largely tied to habitat conversion, habitat fragmentation, habitat degradation, climate change, and recently, West Nile virus (Connelly *et al*. 2004, Walker *et al*. 2007, Schrag *et al*. 2010).

## Red Knot

In North America Red Knots comprise three subspecies; *Calidris canutus islandica* nesting in Greenland and associated islands, *C.c. rufa* nesting to in arctic and subarctic Canada and

migrating along the Atlantic Coast, and *C. c. roselaari* associated with movements along the Pacific Coast to and from western Alaskan and eastern Siberian breeding locales (Baker *et al*. 2013). In 2014, *C. c. rufa* was listed as Threatened (79 FR 73705 73748) largely due to loss of coastal migratory stopover sites and severe declines in food resources, namely breeding horseshoe crabs (*Limulus polyphemus*). Members of this subspecies have been noted migrating across the interior of North America, hence, it is a listed species for the Project Area. Wetland borders, especially along large water bodies, are important foraging areas for Red Knots on both northward and southward migration with only small numbers migrating inland enroute (Baker *et al*. 2013).

### Sprague's Pipit

A small and relatively nondescript North American endemic, this bird is often heard well-before it is ever seen. Sprague's Pipits, like other members of the Motacillidae, inhabit grass-dominated and vegetatively simple communities. In 2010, this species was designated a Candidate Species (75 FR 69222-69294), a classification that was reiterated in 2014 (79 FR 72449 7249). Generally, Sprague's Pipits prefer to breed in native grasslands of intermediate height and moderate vegetative structural diversity (Jones 2010 and the references therein). Such a description is applicable to the Project Area; however, the diversity of the native grasses is quite low [monotypic communities are largely dominated by western wheatgrass (*Pascopyrum smithii)* with occasional codominance by blue grama (*Bouteloua gracilis*) on ridgelines]. Pipit breeding habitat exhibits bare ground coverage of less than 10% in Montana (Davis *et al*. 1999), whereas, across the Project Area bare ground levels are often higher. We performed point count surveys as well as transect surveys for Sprague's Pipits. No breeding activity was documented but this species moves southward through the area in early fall and northward in mid spring.

### Whooping Crane

The Whooping Crane (*Grus americana*), a North American endemic is one of the rarest birds in the world (Urbanek and Lewis 2015). Efforts to recover this species have been difficult yielding approximately 400-450 birds in the wild. Originally an uncommon or rare species of tall- and mixed-grass prairies, only one self-sustaining population remains in the wild breeding in and near Wood Buffalo National Park (Northwest Territories and Alberta) while wintering along the Texas Gulf Coast. Whooping Cranes are dependent upon freshwater wetlands during breeding and migration, a habitat markedly rare in the Project Area.

Whooping Cranes are known to migrate through South Dakota as part of the Central Flyway. Their flight heights can be quite high (500-1000 m) but most time is spent less than 600 m altitude (Kuyt 1992), potentially bringing them into risk from wind turbine collision. However, no Whooping Cranes have been observed in the overall area since 1972 (SDNHP) .

### Northern Long-eared Bat

Recently Federally listed as Threatened (80 FR 17973 18033), the northern long-eared bat has suffered dramatic declines through infection by white-nose syndrome (WNS, *Pseudogymnoascus destructans*). This fungal disease has moved westward and in its wake, it has left reduced

populations of bats, including this species (USFWS 2015a). The Project Area lies at the western edge of northern long-eared bat range (Tigner and Stukel 2003, 80 FR 17973 18033). Additionally, roosting and high quality foraging habitats are rare or nonexistent in the Project Area. Being so, however, several studies have documented substantial numbers of northern long-eared Bats moving across sites in central and western South Dakota (see references within 80 FR 17973 18033). Hence, passive and active monitoring procedures were deployed to determine the presence of this species in and/or adjacent to the Project Area (Atkinson 2011, 2014, in prep.).

Northern long-eared bats are described as 'forest bats' generally associated with woodland or forested communities in which they forage by foliage gleaning (Amelon and Burhans 2006). This species is known to reside year round in the Black Hills (Tigner and Stukel 2003) and has been documented elsewhere in South Dakota but generally in more wooded habitats (see references in 80 FR 17973 18033). However, recent studies by the Montana Natural Heritage Program have brought into question the high abundance and ubiquitous distribution of northern long-eared bats in western South Dakota (Bryce Maxell, MTNHP, pers. comm.. 7 Sept 2015). Over a two-year period including acoustical surveys and mist-netting in areas near Newell and elsewhere in western South Dakota, no northern long-eared bats were encountered (Bachen and Maxell 2014). Initially, several calls were automatically classified as this species through software algorithms but upon further interpretation these calls were determined to be approach calls of species other than northern long-eared bats.

# METHODS

## General Introductory Methods

We began summer general wildlife surveys and raptor surveys in July 2011 through which Golden Eagles, Ferruginous Hawks, Burrowing Owls, and several other raptor species were observed. One historically occupied Ferruginous Hawk nest was located within the Project Buffer-Initial at that time. In addition to the aforementioned species, we observed the following BLM Sensitive Species on the Project: Long-billed Curlews, Loggerhead Shrikes, Chestnut-collared Longspurs, black-tailed prairie dogs, and swift foxes. Adjacent to the Project, northern leopard frogs (*Lithobates* (*Rana*) *pipiens*), Great Plains toads, one snapping turtle (*Chelydra serpentina*), and Dickcissels were observed. Furthermore, one potential Sprague's Pipit, a young of the year, was observed in the Project Area but a confident identification was not secured (Atkinson 2011). The possibility remains that this sighting was actually an immature Horned Lark (*Eremophila alpestris*). These results were incorporated into more vigorous biological inventory methodologies as outlined below.

During January 2013, we surveyed the Project Buffer-Initial for winter use and occupancy by BLM Sensitive Species and raptors (Atkinson 2013). Following these Winter surveys, we performed Early Spring (late March) breeding season surveys for raptors (including aerial surveys), songbirds, general wildlife, and upland game bird leks. Subsequently, in early June 2013, we initiated raptor, passerine, bat, and general wildlife surveys corresponding to the Late Spring breeding season. In consultation with USFWS and SDGFP while also responding to USFWS (2013) guidelines, surveys were extended year-round and raptor point count duration was expanded to 60-minute counts.

Herein, we document the methods and results following standardized protocols across the Project Area. This document addresses portions of Tiers 1 and 2 leading toward a Bird and Bat Conservation Strategy (BBCS) as recommended in the U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines (USFWS 2012), while providing information valuable for Stage 1 of the USFWS Eagle Conservation Plan.

## GIS

We gathered GIS data from a variety of sources including the South Dakota Natural Heritage Program, Bing Maps, and Bureau of Land Management to provide base maps for depiction and analyses of the Project. Initially, buffering the Project by 2-miles (3220 m), yielded a survey area of approximately 91,095 acres (36,865 ha) corresponding heretofore with "Project" (Figure 1). The planned Project Area was expanded and realigned on several occasions through the reconnaissance as mentioned above. Ultimately, the Project was moved more toward the northeast and away from the Belle Fourche River (as well as away from occupied Bald Eagle nests we located along this drainage in Spring 2013). We included areas within a 10-mile buffer of the Project, herein known as Project Buffer-Final for assessment (USFWS 2012).

In 2011 and again in the fall of 2013, we received black-tailed prairie dog colony coverage from South Dakota Natural Heritage Program (Silka Kempema, pers. comm.). This coverage proved to be essential in the description of raptor use of the Project even though we determined lapses in

the accuracy of the coverage (areas occupied by prairie dogs but not contained within the coverage).

All data management was performed in UTM Zone 13 NAD83 meters within ArcMAP 10.0 (ESRI 2011) while performing many analyses in ArcView 3.2 (ESRI 1999). We collected, manipulated, and analyzed all spatial data in NAD83 UTM Zone 13 meters, with all tabular results presented in this projection.

## Rare, Threatened, or Endangered Species

We performed general wildlife surveys across the Project Buffer-Initial and Project Buffer-Final to determine the presence of anticipated Rare, Threatened, or Endangered species including BLM classified Species of Concern. These surveys were coupled with those specific methods targeting raptors (i.e., Bald Eagles, Swainson's Hawks, Ferruginous Hawks, Golden Eagles, Peregrine and Prairie Falcons, and Burrowing Owls for instance), prairie landbirds (Long-billed Curlews, Sprague's Pipits, Baird's Sparrows, Chestnut-collared Longspurs, and McCown's Longspurs) and bats [Northern Long-Eared Bat (*Myotis septentrionalis*)]. Black-tailed prairie dogs were noted as were all other mammals encountered including the South Dakota NHP-tracked swift fox. Nocturnal roadside spotlighting was performed on several occasions for swift fox presence. We performed visual encounter surveys for reptiles and amphibians in suitable areas on an *ad hoc* basis.

## Raptors

Initially for winter season surveys within the Project, we placed Raptor Point Count Stations following a randomized sampling distribution in which sites selected following a viewshed analysis. Point count locations included in the sampling scheme were those exhibiting greater than 50% visibility within 1000 m. We populated the buffered Project Buffer-Initial with 17 1-km radius point counts. Efforts were followed to separate each point count center by at least 2400 m but due to field limitations (i.e., impassable snow drifts and inaccessible roads) certain locations that were more closed were located with a minimum distance equaling 1460 m between two point count centers (Raptor Point Count Survey sites R15 and R34). During spring surveys, we revisited some of the Raptor Point Count Survey sites while adding additional locations for year round surveys in 2014 when we extended the count time to 60 minutes of observation following consultation with USFWS and SDGFP (Figure 2).

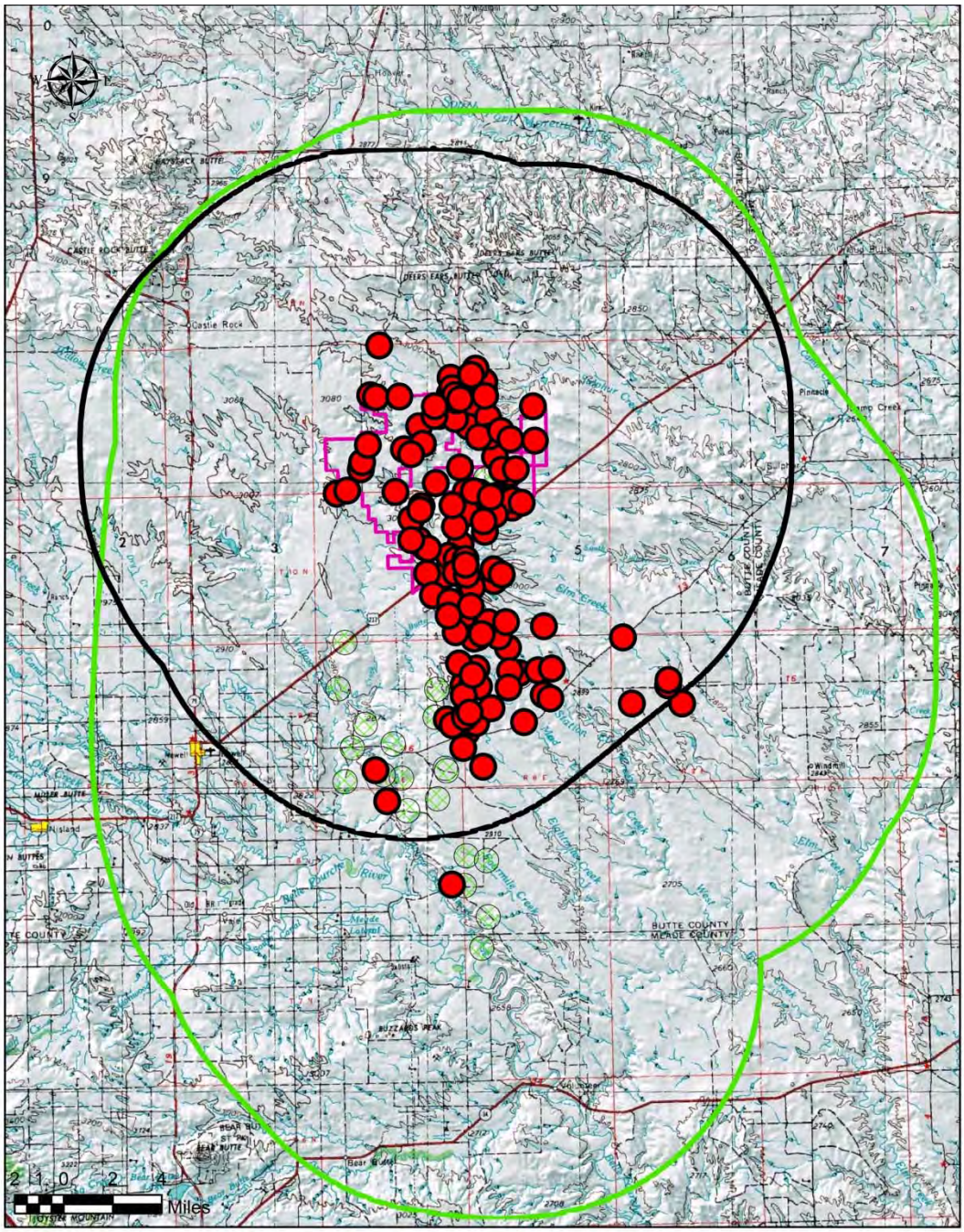
We counted all raptors observed over 20 (2013) or 60 (2014 and 2015) minutes (Strickland *et al*. 2011) differentiating gender and age when able, behavior, flight height and direction, and distance from point center at each Raptor Point Count Station (Appendix A-1). As 2013 efforts were preliminary, and habitats across the area are open grasslands, we selected a count duration of 20-minutes across a radius of 1000 m rather than 800 m as some authors have suggested (USFWS 2011). One-thousand meters corresponds to the distance at which a raven-sized bird and larger can be observed with unaided eyes (Watson *et al*. 1996). GPS locations were recorded for each raptor encountered. For each raptor observed, we recorded behavior, height above ground, and flight direction (unless perched) while also estimating its position with respect to the point center. We followed these same methods through all surveys year-round.

In addition to enumerating raptors through Raptor Point Count Stations, we performed vehicle-based transects across the study area and while moving between point count locations. For each

transect bout, we drove at slow speeds (generally, less than 10 mph) recording all raptors observed at unlimited sight distances. Logistically however, we truncated distance perpendicular to vehicle travel at 800 m determining that this distance more accurately described the area actually surveyed due to topographical relief.

We performed aerial surveys for nesting raptors from a Robinson R44 Raven helicopter flying at 150-500 feet height. Survey speeds ranged from 5-25 mph. All raptor nests were observed for occupancy and breeding stage without flushing attending adults. GPS coordinates were recorded for each nest and locations of raptors observed were recorded.

**Figure 2. Locations of 20 & 60 min Raptor Point Count Surveys; 2013-2014 [Scale (1:341,038)]**



## Upland Game Birds

We performed Sharp-tailed Grouse lek surveys in late March and early April 2013 by driving slowly through the Project Buffer-Initial and Project Buffer-Final at dawn through mid-morning hours. Every 0.5-1.0 mile we stopped and moving away from the vehicle, listened for Sharp-tailed Grouse calls for a minimum of 3-minutes, similar but more precise than the method outlined in SDGFP (2011). Additionally, we surveyed the Project Buffer-Final from the air while ferrying to likely raptor breeding sites during surveys in March 2013 and March 2014.

## Prairie Passerines & Other Landbirds

During June 2013 and May and June 2014, we surveyed landbirds (passerines, raptors, and Charadriiformes, but concentrating on passerines) through standardized 10-minute point counts, following protocols outlined by Hutto *et al*. (1986). We employed a nonfixed distance sampling method to adequately enumerate nonpasserines while most passerines are encountered within a distance of 100 m. Bird species was recorded as was sex, when appropriate; behavior at first sighting (singing, calling, or visually encountered), distance from point center (i.e., observer), and associated habitat type (Appendix B). We performed avian point count surveys performed in morning hours across the Project Area, Project Buffer-Initial, and Project Buffer-Final (3).

Furthermore, vehicle and pedestrian surveys for landbirds were performed across the Project Buffers through all visits. We often investigated areas of notable vegetation diversity (i.e., ephemeral wetlands or areas exhibiting hydrophilic vegetation, well-drained ridgelines, or grassy draws) for the presence of additional avian species. We were especially alert to habitats suitable for Sprague's Pipit foraging and nesting. In areas appearing most suitable for this species we played Sprague's Pipit song (Sibley eGuide to Birds App 2013) in hopes to elicit responses. We neither heard nor saw any responding pipits.

## Bats

The South Dakota Bat Management Plan (South Dakota Bat Working Group 2004) identified investigating potential threats to bats associated with wind power development as a priority research strategy (pg. 31), "Strategy 5.2G.Analyze the potential threats in areas selected as high priority for wind power generation and determine the effects of wind power generation sites on migratory bat populations in South Dakota."

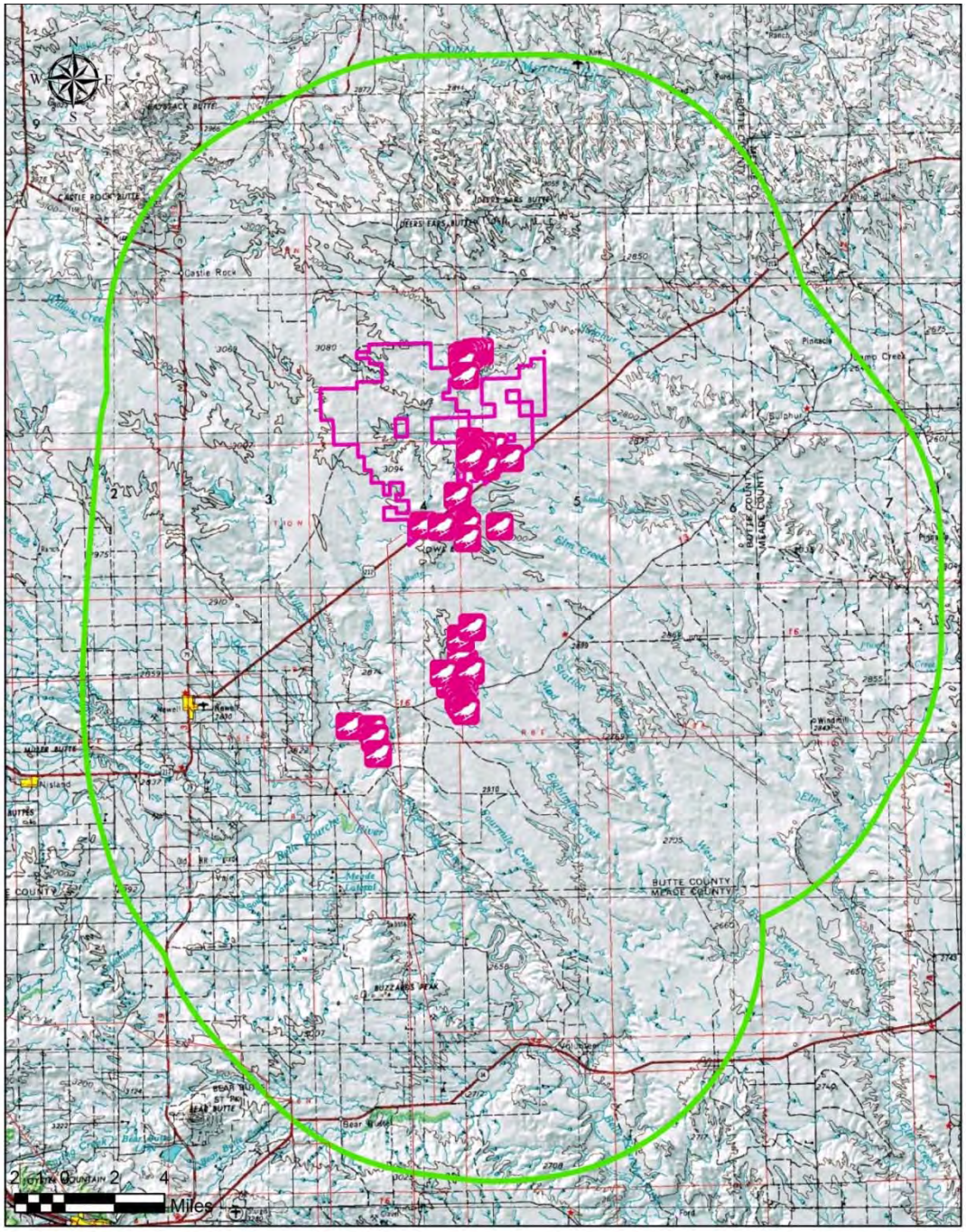
Initially, we actively surveyed ponds within the Project Buffers and Project Area for bats during evening and nighttime hours. Specifically, we selected lentic water bodies that were located within the Project Buffers and showed growth of some emergent vegetation [*Scirpus americanus*, *Typha latifolia*, and various sedges (*Eleocharis* and/or *Carex* spp.)]. We actively surveyed for socially calling or echolocating bats with the use of electronic bat detectors (Batbox Baton, Batbox Limited) wired to an mp3 player for recording, if warranted.

Additionally, we deployed an Anabat Express (Titley Scientific) to passively record and monitor bats from August-November 2014. We were in hopes of documenting migration and foraging by bats in high quality habitat that was not necessarily representative of the Project Area overall. In other words, we attempted to document bat presence in the most conducive habitats to assess the potential for various bat species presence. Hence, we deployed the monitoring device at a permanent stock pond approximately 4 km (2.5 miles) north of the project footprint. This site

offered open water, cattails (*Typha latifolia*), and suitable trees (*Salix amygdaloides*) for roosting situated along a nearly permanent watercourse (Figure 4, North Fork Double R Creek).

In 2015 with the maturation of the Project Area boundaries, we deployed an Anabat Express on 24 June through 30 October 2015 (Figure 4). This unit was deployed in a mature and decadent shelterbelt of Russian olive (*Eleagnus angustifolia*), Siberian elm (*Ulmus pumila*), and eastern red cedar (*Juniperus virginianus*).

**Figure 3. Locations of Avian Point Count Surveys; 2013-2014**
**[Scale (1:341,038)]**




**Legend**

- AVIANPTCOUNTSITES
- PROJECT_JULY2015UTM
- BearButte Transmission Lines
- 10MILEBUFFER_FALL2013UPDATED

Prepared by
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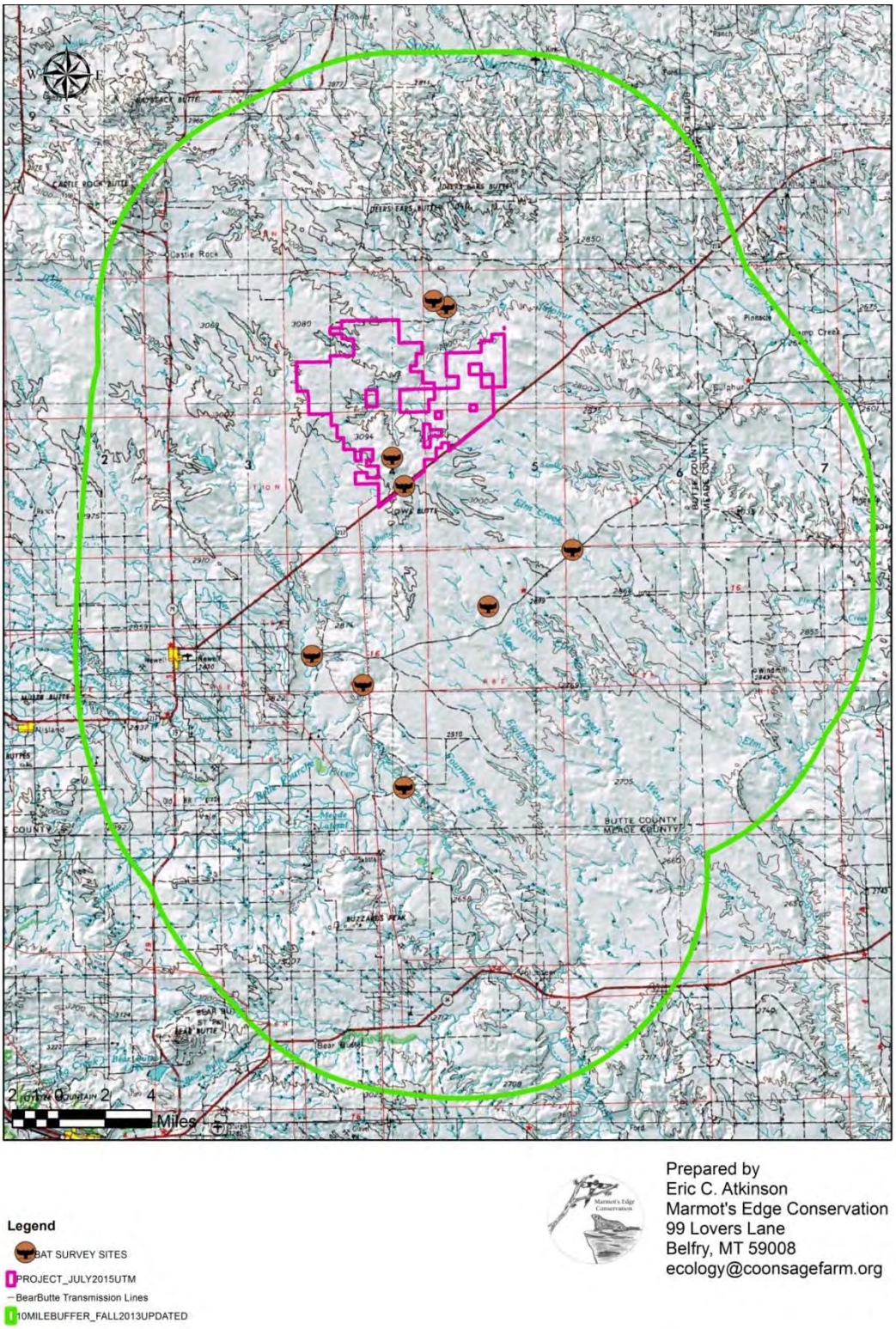
**Figure 4. Locations of Acoustical Bat Survey Points; 2013-2015**
**[Scale (1:341,038)]**



# RESULTS & DISCUSSION

## Wildlife

Wildlife species richness, including vertebrates and invertebrates alike, observed in and adjacent to the Project Area was relatively low (Table A-3). One-hundred forty-four species of vertebrates were observed comprising four amphibian species, six reptiles, 118 avian species, and 26 mammal species. Terrestrial wildlife species could be impacted at various spatial and temporal scales during the construction phase of the project. Direct disruption of habitat and potentially direct mortality would likely occur during construction phase on approximately 44 ha (109 acres). These impacts would be ephemeral and would most strongly affect small mammals and passerines. Permanent habitat loss due to construction of wind turbines will be minimal across the Project Area and localized.

Construction crews will be instructed to avoid disturbing or harassing wildlife and direct mortalities would not likely impact wildlife populations. Following construction, wildlife species are expected to habituate to routine facility operation and maintenance activities in a manner similar to relationships with existing ranching operations. Leave-no-trace philosophy would be practiced by construction personnel to minimize attractants to scavengers and would-be nest predators such as red foxes (*Vulpes vulpes*), striped skunks (*Mephitis mephitis*), raccoons (*Procyon lotor*), and American Crows (*Corvus brachyrhynchos*). At this time, Common Ravens (*Corvus corax*) do not inhabit the Project Area.

Potential impacts to sensitive terrestrial species will be evaluated via Consistency Evaluation Forms (see Part B) within the Bird and Bat Conservation Strategy.

## Table A-3. Animal Species Observed on and/or Adjacent to the Project Area of the Willow Creek Wind Power Facility; 2011-2015

| Common Name | Latin Binomial | SDNHP Rank/Status[1] | BLM Status | Federal Status | Buffer Relative Abundance[2] | Project Area Relative Abundance[2] |
|---|---|---|---|---|---|---|
| Calico Crayfish | *Orconectes immunis* | | | | C | C |
| A Stone Centipede | Lithobiomorpha | | | | C | C |
| Blue-fronted Dancer Damselfly | *Argia apicalis* | | | | C | U |
| Common Green Darner | *Anax junius* | | | | U | U |
| Eight-spotted Skimmer | *Libellula forensis* | | | | A | R |
| Twelve-spotted Skimmer | *Libellula pulchella* | | | | U | R |
| Common Whitetail | *Plathemis lydia* | | | | C | R |
| A Hawk Moth | *Sphingidae* | | | | U | U |
| Western Banded Skipper | *Hesperia colorado* | | | | C | C |
| Pipevine Swallowtail | *Battus philenor* | | | | R | R |
| Clouded Sulphur | *Colias philodice* | | | | C | C |
| American Lady | *Vanessa virginiensis* | | | | U | U |
| Common Wood Nymph | *Cercyonis pegala* | | | | C | C |
| Greater Fritallary | *Speyeria* sp. | | | | R | R |
| Mellissa Blue | *Plebejus melissa* | | | | C | R |
| A Biting Midge | Ceratopogonidae | | | | A | A |
| Mosquito | *Culex tarsalis* | | | | A | A |
| A Mosquito | *Culex* sp. | | | | A | A |
| A Mosquito | *Aedes* sp. | | | | A | A |
| Common House Fly | *Musca domestica* | | | | A | A |
| Blue Bottle Fly | *Calliphora vomitoria* | | | | A | A |
| A Stable Fly | *Stomoxys* sp. | | | | A | A |
| A Deerfly | *Chrysops* sp. | | | | A | A |
| A Horsefly | *Tabanus* sp. | | | | A | A |
| A Bumblebee | *Bombus* sp. | | | | U | R |
| Honeybee | *Apis mellifera* | | | | C | C |
| Western Thatching Ant | *Formica obscuripes* | | | | C | C |
| Carrion Beetle | Silphidae | | | | C | C |
| Dung Beetle | Scarabaeinae | | | | C | C |

| Common Name | Latin Binomial | SDNHP Rank/Status[1] | BLM Status | Federal Status | Buffer Relative Abundance[2] | Project Area Relative Abundance[2] |
|---|---|---|---|---|---|---|
| Seven-spot Ladybird Beetle | *Coccinella septempunctata* | | | | C | C |
| Green Lacewing | *Chrysoperla* sp. | | | | U | U |
| Common Field Cricket | *Acheta assimilis* | | | | A | A |
| Carolina Locust | *Dissosteira carolinus* | | | | A | A |
| Red-winged Grasshopper | *Arphia pseudonietana* | | | | A | A |
| Yellow-winged Grasshopper | *Arphia xanthoptera* | | | | C | C |
| A Caddisfly | Glossosomatidae | | | | U | R |
| Box Elder Bug | *Boisea trivittata* | | | | C | R |
| Great Plains Toad | *Anaxyrus* (*Bufo*) *cognatus* | | Sensitive | | X | X |
| Boreal Chorus Frog | *Psuedacris maculata* | | | | A | A |
| Northern Leopard Frog | *Lithobates* (*Rana*) *pipiens* | | Sensitive[3] | | C | R |
| Tiger Salamander | *Ambystoma tigrinum* | | | | C | C |
| Snapping Turtle | *Chelydra serpentina* | | Sensitive | | X | X |
| Smooth Softshell | *Apalone mutica* | S2 | | | U | X |
| North American Racer | *Coluber constrictor* | | | | U | R |
| Common Gartersnake | *Thamnophis sirtalis* | | | | R | R |
| Plains Gartersnake | *Thamnophis radix* | | | | C | R |
| Bull Snake | *Pituophis catenifer* | | | | A | R |
| Prairie Rattlesnake | *Crotalus viridis* | | | | C | R |
| Eared Grebe | *Podiceps nigricollis* | | | | R | R |
| Pied-billed Grebe | *Podilymbus podiceps* | | | | R | R |
| Great Blue Heron | *Ardea herodias* | S4B,SZN | | | U | R |
| Turkey Vulture | *Cathartes aura* | | | | C | C |
| Canada Goose | *Branta canadensis* | | | | C | R |
| Mallard | *Anas platyrhychos* | | | | C | R |
| Gadwall | *Anas strepera* | | | | C | R |
| Northern Pintail | *Anas acuta* | | | | C | R |
| American Wigeon | *Anas americana* | | | | C | R |
| Northern Shoveler | *Anas clypeata* | | | | C | R |
| Cinnamon Teal | *Anas cyanoptera* | | | | R | R |
| Blue-winged Teal | *Anas discors* | | | | R | R |

| Common Name | Latin Binomial | SDNHP Rank/Status[1] | BLM Status | Federal Status | Buffer Relative Abundance[2] | Project Area Relative Abundance[2] |
|---|---|---|---|---|---|---|
| American Green-winged Teal | *Anas crecca* | | | | C | R |
| Canvasback | *Aythya valisineria* | | | | R | R |
| Redhead | *Aythya americana* | | | | R | R |
| Ring-necked Duck | *Aythya collaris* | | | | R | R |
| Lesser Scaup | *Aythya affinis* | | | | R | R |
| Common Goldeneye | *Bucephala clangula* | | | | R | R |
| Bufflehead | *Bucephala albeola* | S1B,S2N | | | R | R |
| Common Merganser | *Mergus merganser* | S2B,S3N | | | U | R |
| Ruddy Duck | *Oxyura jamaicensis* | | | | U | R |
| Northern Harrier | *Circus cyaneus* | | | | C | C |
| Sharp-shinned Hawk | *Accipiter striatus* | S3B,S3N | | | R | R |
| Cooper's Hawk | *Accipiter cooperii* | S3B,SZN | | | R | R |
| Broad-winged Hawk | *Buteo platypterus* | S2B,SZN | | | R | R |
| Swainson's Hawk | *Buteo swainsoni* | S4B,SZN | Sensitive | | U | U |
| Red-tailed Hawk | *Buteo jamaicensis* | | | | U | U |
| Ferruginous Hawk | *Buteo regalis* | S4B,SZN | Sensitive | | C | C |
| Rough-legged Hawk | *Buteo lagopus* | | | | C | C |
| Golden Eagle | *Aquila chrysaetos* | S3S4B,S3N | Sensitive | | C | U |
| Bald Eagle | *Haliaeetus leucocephalus* | S1B,S2N/LT | | | R | R |
| American Kestrel | *Falco sparverius* | | | | C | R |
| Merlin | *Falco columbarius* | S3B,S3N | | | R | R |
| Peregrine Falcon | *Falco peregrinus* | SXB,SZN | Sensitive | | U | R |
| Prairie Falcon | *Falco mexicanus* | S3S4B,S4N | | | U | R |
| Gray Partridge | *Perdix perdis* | | | | C | R |
| Ring-necked Pheasant | *Phasianus colchicus* | | | | C | R |
| Sharp-tailed Grouse | *Tympanuchus phasianellus* | | | | C | R |
| Wild Turkey | *Meleagris gallopavo* | | | | C | R |
| American Coot | *Fulica americana* | | | | C | R |
| Sora | *Porzana carolina* | | | | R | R |
| Sandhill Crane | *Grus canadensis* | | | | U | U |
| Killdeer | *Charadrius vociferus* | | | | C | C |

| Common Name | Latin Binomial | SDNHP Rank/Status[1] | BLM Status | Federal Status | Buffer Relative Abundance[2] | Project Area Relative Abundance[2] |
|---|---|---|---|---|---|---|
| American Avocet | *Recurvirostra americana* | | | | C | U |
| Greater Yellowlegs | *Tringa melanoleuca* | | | | R | R |
| Lesser Yellowlegs | *Tringa flavipes* | | | | R | R |
| Solitary Sandpiper | *Tringa solitaria* | | | | R | R |
| Spotted Sandpiper | *Actitis macularis* | | | | R | R |
| Upland Sandpiper | *Bartramia longicauda* | | | | U | U |
| Long-billed Curlew | *Numenius americanus* | S3B,SZN | Sensitive | | U | R |
| Marbled Godwit | *Limosa fedoa* | | Sensitive | | U | R |
| Baird's Sandpiper | *Calidris bairdii* | | | | R | R |
| Wilson's Phalarope | *Phalaropus tricolor* | | | | C | R |
| Ring-billed Gull | *Larus delawarensis* | | | | U | R |
| California Gull | *Larus californicus* | | | | C | R |
| Mourning Dove | *Zenaida macroura* | | | | C | U |
| Eurasian Collared-Dove | *Streptopelia decaocto* | | | | X | X |
| Rock Pigeon | *Columba livia* | | | | U | R |
| Short-eared Owl | *Asio flammeus* | | | | U | R |
| Great Horned Owl | *Bubo virginianus* | | | | C | R |
| Snowy Owl | *Bubo scandiacus* | | | | R | R |
| Burrowing Owl | *Athena cunicularia* | S3S4B,SZN | Sensitive | | C | R |
| Common Nighthawk | *Chordeiles minor* | | | | U | R |
| Belted Kingfisher | *Megaceryle alcyon* | | | | X | X |
| Northern Flicker (Yellow-shafted) | *Colaptes auratus* | | | | U | R |
| Say's Phoebe | *Sayornis saya* | | | | R | R |
| Western Kingbird | *Tyrannus verticalis* | | | | C | R |
| Eastern Kingbird | *Tyrannus tyrannus* | | | | C | R |
| Loggerhead Shrike | *Lanius ludovicianus* | | Sensitive | | U | R |
| Northern Shrike | *Lanius excubitor* | | | | X | X |
| Blue Jay | *Cyanocitta cristata* | | | | X | X |
| Black-billed Magpie | *Pica hudsonia* | | | | R | R |
| American Crow | *Corvus brachyrhynchos* | | | | R | R |
| Horned Lark | *Eremophila alpestris* | | | | A | A |

| Common Name | Latin Binomial | SDNHP Rank/Status[1] | BLM Status | Federal Status | Buffer Relative Abundance[2] | Project Area Relative Abundance[2] |
|---|---|---|---|---|---|---|
| Cliff Swallow | *Petrochelidon pyrrhonota* | | | | U | U |
| Barn Swallow | *Hirundo rustica* | | | | C | C |
| Mountain Bluebird | *Sialia currucoides* | | | | U | R |
| American Robin | *Turdus migratorius* | | | | C | R |
| Brown Thrasher | *Toxostoma rufum* | | | | R | R |
| European Starling | *Sternus vulgaris* | | | | C | R |
| Sprague's Pipit | *Anthus spragueii* | S2B,SZN | Sensitive | Candidate | R | R |
| American Pipit | *Anthus rubescens* | | | | U | R |
| Common Yellowthroat | *Geothlypis trichas* | | | | U | R |
| Dickcissel | *Spiza americana* | | Sensitive | | U | R |
| American Tree Sparrow | *Spizella arborea* | | | | C | R |
| Chipping Sparrow | *Spizella passerina* | | | | U | R |
| Baird's Sparrow | *Ammodramus bairdii* | S2B,SZN | Sensitive | | U | U |
| Grasshopper Sparrow | *Ammodramus savannarum* | | | | A | A |
| Savannah Sparrow | *Passerculus sandwichensis* | | | | U | U |
| Vesper Sparrow | *Pooecetes gramineus* | | | | U | U |
| Lark Bunting | *Calamospiza melanocorys* | | | | C | C |
| Lark Sparrow | *Chondestes grammacus* | | | | X | X |
| Song Sparrow | *Melospiza melodia* | | | | R | R |
| Dark-eyed Junco | *Junco hyemalis* | | | | R | R |
| McCown's Longspur | *Rhynchophanes mccownii* | SUB,SZN | | | C | R |
| Chestnut-collared Longspur | *Calcarius ornatus* | | Sensitive | | C | C |
| Lapland Longspur | *Calcarius lapponicus* | | | | C | U |
| Snow Bunting | *Plectrophenax nivalis* | | | | C | U |
| Western Meadowlark | *Sternella neglecta* | | | | A | A |
| Bobolink | *Dolichonyx oryzivorus* | | Sensitive | | C | U |
| Brown-headed Cowbird | *Molothrus ater* | | | | C | C |
| Red-winged Blackbird | *Agelaius phoeniceus* | | | | C | C |

| Common Name | Latin Binomial | SDNHP Rank/Status[1] | BLM Status | Federal Status | Buffer Relative Abundance[2] | Project Area Relative Abundance[2] |
|---|---|---|---|---|---|---|
| Yellow-headed Blackbird | *Xanthocephalus xanthocephalus* | | | | C | C |
| Brewer's Blackbird | *Euphagus cyanocephalus* | | | | U | U |
| Orchard Oriole | *Icterus spurius* | | | | U | R |
| Common Redpoll | *Acanthis flammea* | | | | R | R |
| House Sparrow | *Passer domesticus* | | | | R | R |
| Thirteen-lined Ground Squirrel | *Ictidomys tridecemlineatus* | | | | U | U |
| Black-tailed Prairie Dog | *Cynomys ludovicianus* | | Sensitive | | A | R |
| Northern Pocket Gopher | *Thomomys talpoides* | | | | C | C |
| Common Muskrat | *Ondatra zibethicus* | | | | U | U |
| Meadow Vole | *Microtus pennsylvanicus* | | | | C | A |
| Bushy-tailed Woodrat | *Neotoma cinerea* | | | | U | R |
| Deermouse | *Peromyscus maniculatus* | | | | C | C |
| Desert Cottontail | *Sylvilagus audubonii* | | | | U | A |
| Eastern Cottontail | *Sylvilagus floridanus* | | | | X | X |
| White-tailed Jackrabbit | *Lepus townsendii* | | | | C | C |
| Big Brown Bat | *Eptesicus fuscus* | | | | R | X |
| Unidentified *Myotis* bat | *Myotis* sp. | | | | R | R |
| Fringed or Big-eared Myotis | *Myotis thysanodes/evotis* | | | | U | R |
| Northern Long-eared Bat | *Myotis septentrionalis* | S3 | Sensitive | Threatened | R[4] | X |
| Hoary Bat | *Lasiurus cinereus* | | | | R | X |
| Bobcat | *Lynx rufus* | | | | R | R |
| Coyote | *Canis latrans* | | | | R | R |
| Swift Fox | *Vulpes velox* | State Threatened/S1 | Sensitive | | R | X |
| Red Fox | *Vulpes vulpes* | | | | U | R |
| Badger | *Taxidea taxus* | | | | U | U |
| Striped Skunk | *Mephitis mephitis* | | | | U | U |
| Raccoon | *Procyon lotor* | | | | U | U |

| Common Name | Latin Binomial | SDNHP Rank/Status[1] | BLM Status | Federal Status | Buffer Relative Abundance[2] | Project Area Relative Abundance[2] |
|---|---|---|---|---|---|---|
| American Black Bear | *Ursus americanus* | | | | R | R |
| Mule Deer | *Odocoileus hemionus* | | | | C | C |
| White-tailed Deer | *Odocoileus virginianus* | | | | U | C |
| Pronghorn | *Antilocapra americana* | | | | C | C |

Bird species may have two state ranks, one for breeding (S#B) and one for nonbreeding seasons (S#N). Example: Ferruginous Hawk (S3B,SZN) indicates an S3 rank in breeding season and SZ in nonbreeding season.
(1) State Rank Definition (applied statewide for state rank)
(2) Abundance categories corresponding to subjective measures of species occurrence in suitable habitats.
(3) Applies to western and intermontane populations
(4) Potential, but no records in hand nearby
S1 = Critically imperiled because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction; S2 = Imperiled because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range; S3 = Either very rare and local throughout its range, or found locally (even abundantly at some of its locations) in a restricted range, or vulnerable to extinction throughout its range because of other factors; in the range of 21 of 100 occurrences; S4 = Apparently secure, though it may be quite rare in parts of its range, especially at the periphery. Cause for long term concern; S5 = Demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery.
SU = Possibly in peril, but status uncertain, more information needed; SH = Historically known, may be rediscovered; SX = Believed extinct, historical records only; SZ = No definable occurrences for conservation purposes, usually assigned to migrants.
A = Abundant: conspicuously present; much more numerous than most species in a given habitat; C = Common: present in moderate to large numbers; likely to be observed; F = Fairly Common: present in moderate numbers; can usually be observed; U = Uncommon: usually present in small numbers; observed infrequently; R = Rare: not to be expected to be observed upon every visit; X = Observed adjacent to Project Buffers

## Raptors

We observed 20 species of raptors across the Project Buffer-Initial and Project Buffer-Final between 2011 and 2015 (Table A-4, Figure 5). Ferruginous Hawks (134 observations) followed by Rough-legged Hawks (122), and Golden Eagles (112) were the most abundant species encountered overall and during standardized point count surveys as well as during general surveys (Figure 6). Rough-legged Hawks were present during the winter months from October-April whereas both Ferruginous Hawks and Golden Eagles were present year round.

Open grassland habitats provide good foraging areas for a variety of raptors whereas nesting sites are limited or only provided for ground- nesting species. In addition to widely distributed white-tailed jackrabbits (*Lepus townsendii*), desert cottontail rabbits (*Sylvilagus audubonii*), rodents [meadow voles (*Microtus pennsylvanicus*), deer mice (*Peromyscus maniculatus*), and northern pocket gophers (*Thomomys talpoides*)], prairie passerines are in abundance, and black-tailed prairie dog colonies occur within the buffered area. Prairie dogs are generally found outside the Project Area to the south and west; no active prairie dog colonies were found within the Project Area.

In 2015 microtine, cricetine, and lagomorph populations across the Western United States were high and these increased population densities likely explained a large influx of immature (second-year) Swainson's Hawks into the hayfields of the Project Area. Furthermore, Northern Harriers were more abundant and we only observed Short-eared Owls (n = 40) in 2015.

Most raptors were initially observed in flight at heights below 100 m with the majority flying at heights less than 50 m above ground level (Figure 7). These heights may be artifacts owing to raptors observed during general wildlife surveys performed on foot, motor vehicle, and bicycle. Raptors soaring at heights over the Project Area were potentially missed while traveling from site to site and even during dedicated Raptor Point Counts, raptors at high altitude are difficult to observe. Ferruginous Hawks and Golden Eagles showed the most variability in flight height whereas Turkey Vultures flew at the greatest average height. During both 60-min and 20-min raptor point count surveys mean distances at which raptors were initially observed were generally greater than 1000 m for approximately half the species encountered (Figure 8) illustrating the need for point count radii to be greater than the suggested 800 m in open and rolling habitat exemplified by Butte County, SD.

During our surveys, we located 37 raptor nests (Figure 9, Table A-5). Eight active Bald Eagle nests were located during pre-leaf out aerial surveys (29 March 2013 and 5 April 2014) and were situated largely along the Belle Fourche River between 16-40.2 km (10-24.9 miles) south of the Project Area. All nests occurred in large plains cottonwood (*Populus deltoides*) trees. Along this stream, we also located two active Golden Eagle nests; one nest in each year. In total then, we located eight active Bald Eagle nests (in addition to three alternate nests) and five active Golden Eagle nests (plus one alternate), four of which remain active (see below). A local landowner also alerted us to the historical presence of a Golden Eagle nest on the southeast face of Deer's Ears Butte. This nest apparently collapsed sometime after the year 2000. The South Dakota Natural

Heritage Database provided the location of an historically occupied (2005) Golden Eagle nest approximately 13 km (8 miles) north of the Project Area but this nest was not located.

**Table A-4. Numbers of Raptors Observed Across the Project Buffer-Initial and Project Buffer-Final 2011-2015**

| Species | Number Observed |
|---|---|
| Turkey Vulture | 21 |
| Bald Eagle | 75 |
| Northern Harrier | 91 |
| Sharp-shinned Hawk | 1 |
| Cooper's Hawk | 1 |
| Broad-winged Hawk | 41 |
| Swainson's Hawk | 40 |
| Red-tailed Hawk | 48 |
| Ferruginous Hawk | 134 |
| Rough-legged Hawk | 122 |
| Buteo sp. | 4 |
| Golden Eagle | 112 |
| Great Horned Owl | 3 |
| Snowy Owl | 1 |
| Burrowing Owl | 26 |
| Short-eared Owl | 40 |
| American Kestrel | 23 |
| Merlin | 5 |
| Peregrine Falcon | 4 |
| Prairie Falcon | 26 |
| Unidentified Raptor | 3 |

Nearest neighbor distance between eagle nests (both Bald Eagle and Golden Eagle) averaged relatively low at 2604 (SE = 456) m owing to the concentration of suitable nesting habitat (trees) along the Belle Fourche River and only along the drainages emanating from Deer's Ears Butte north of the Project Area (Figure 10). Golden Eagle nests, however, owing to a general lack of suitable nesting habitat averaged 15153 m (SE = 5925 m) apart whereas Bald Eagle active nests were more closely spaced (mean = 3290 m SE = 1599 m).

**Table A-5. Raptor nests encountered in the Project Buffer-Final; 2011-2015**

| Species | Number Active Nests | Number Inactive Nests | Number Alternate Nests |
|---|---|---|---|
| Swainson's Hawk | 2 | 1 | 0 |
| Red-tailed Hawk | 8 | 0 | 0 |
| Ferruginous Hawk | 4 | 0 | 3 |
| Golden Eagle | 5 | 0 | 1 |
| Bald Eagle | 8 | 0 | 3 |
| *Buteo* sp. | 0 | 2 | 0 |

**Figure 5. Raptor observations 2011-2015 [Scale (1:341,038)]**

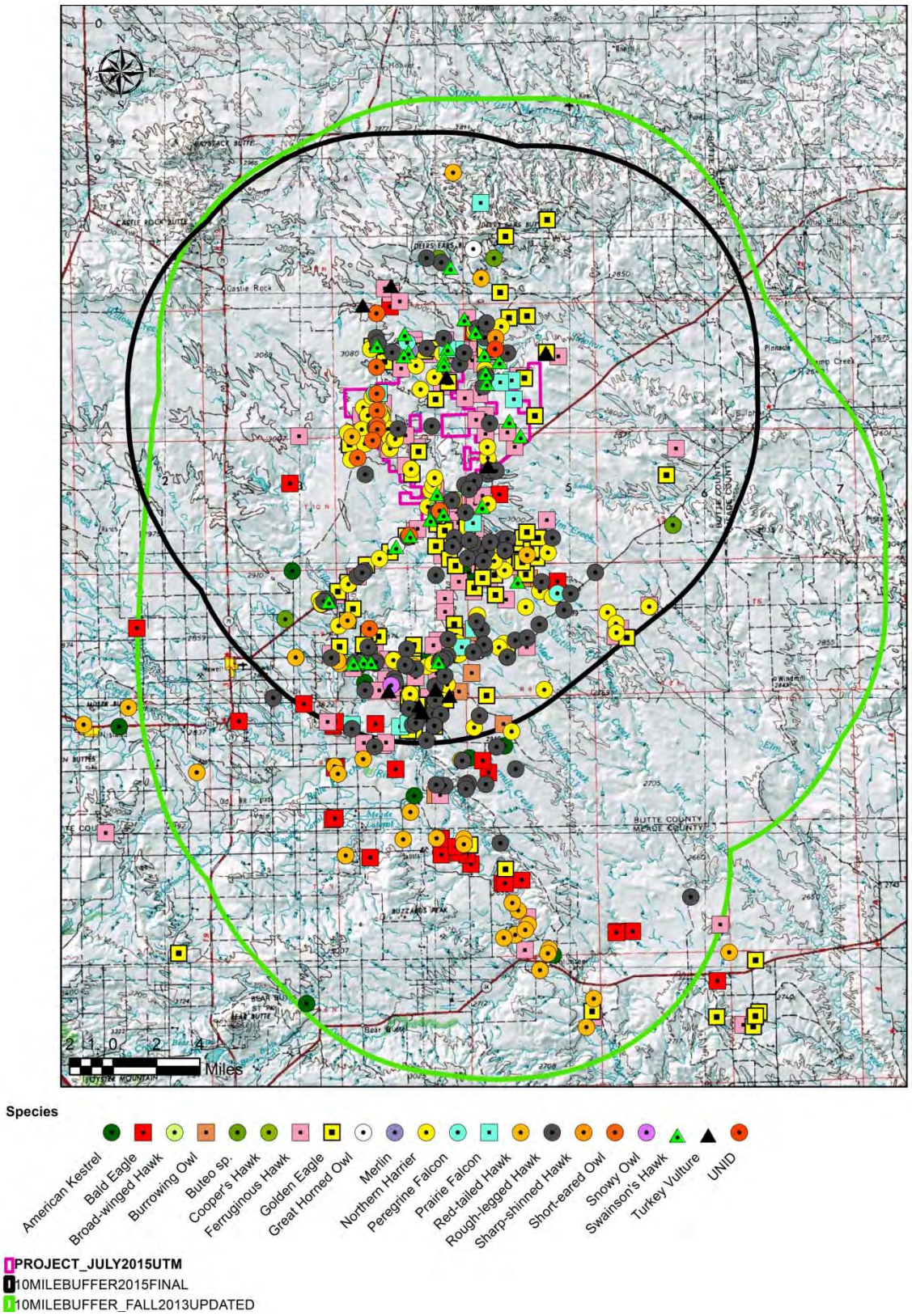
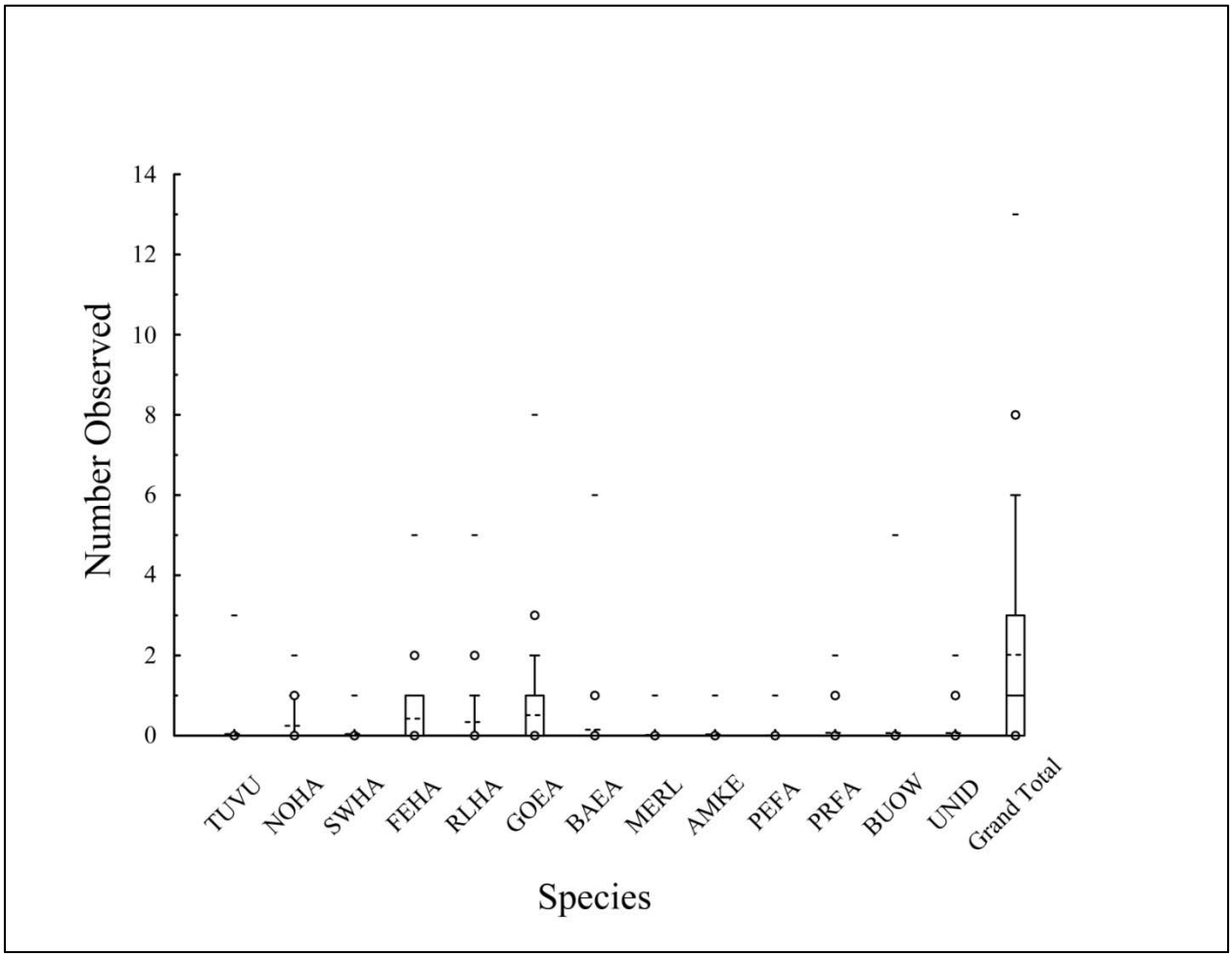
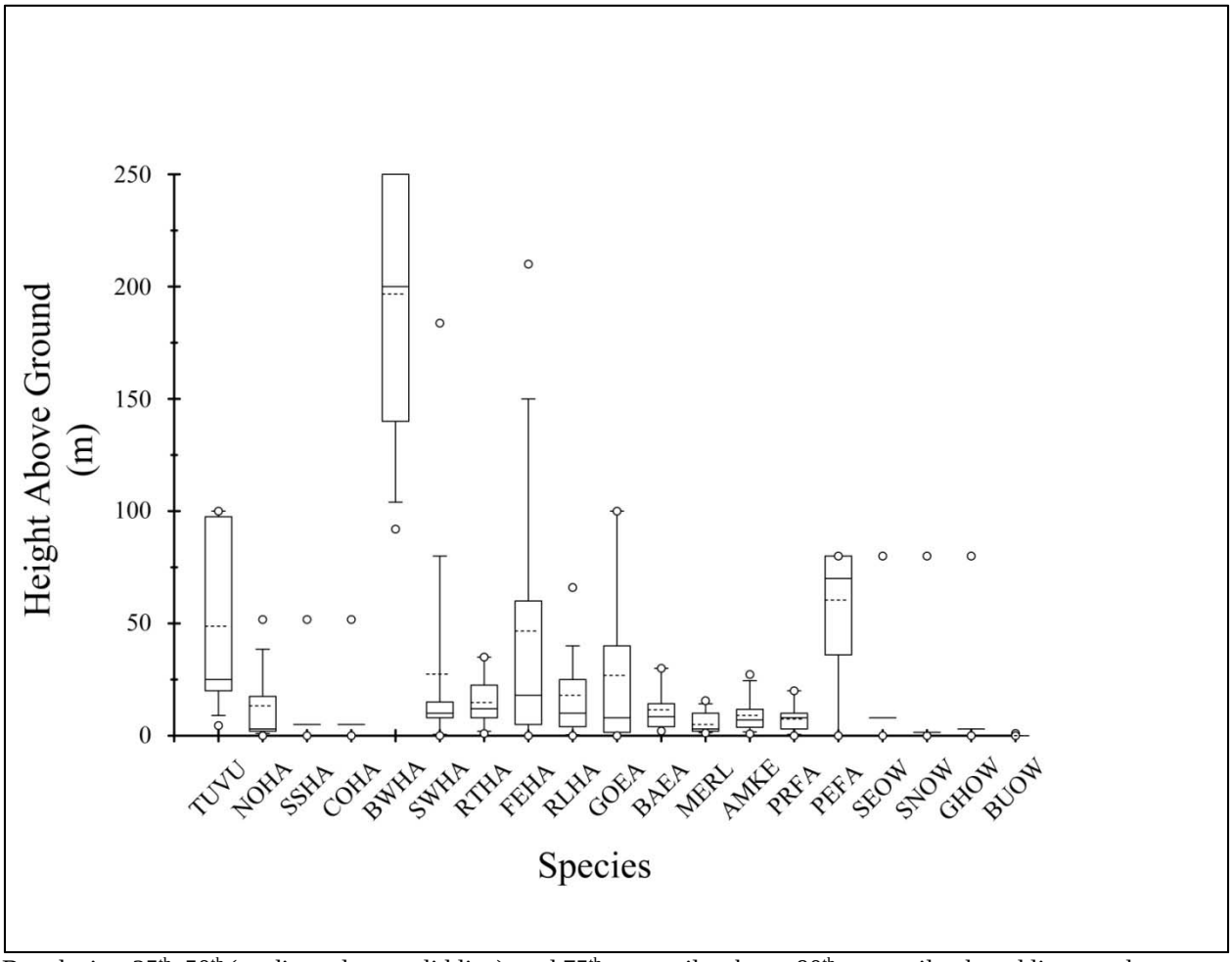


**Figure 6. Numbers of Raptors Observed During 60-minute, 2014**



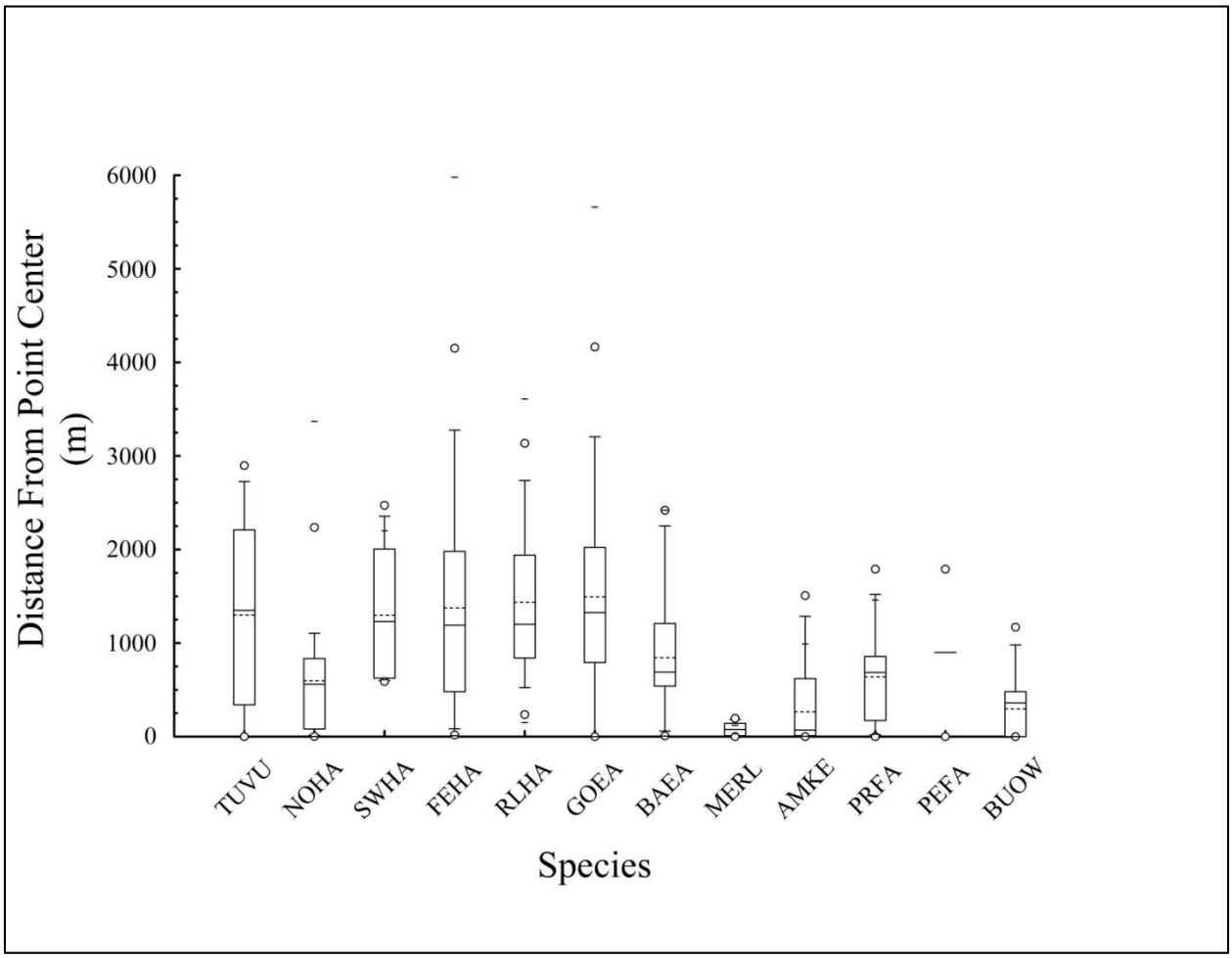

Box depicts 25th, 50th (median = large solid line), and 75th percentiles; bar = 90th percentile; dotted line equals mean; circles indicate 5% & 95% confidence limits; small lines indicate maximum.
TUVU = Turkey Vulture; NOHA = Northern Harrier; SSHA = Sharp-shinned Hawk; COHA = Cooper's Hawk; BWHA = Broad-winged Hawk; SWHA = Swainson's Hawk; RTHA = Red-tailed Hawk; FEHA = Ferruginous Hawk; RLHA = Rough-legged Hawk; GOEA = Golden Eagle; BAEA = Bald Eagle; MERL = Merlin; AMKE = American Kestrel; PRFA = Prairie Falcon; PEFA = Peregrine Falcon; SEOW = Short-eared Owl; GHOW = Great Horned Owl; SNOW = Snowy Owl; BUOW = Burrowing Owl; UNID = Unidentified.

**Figure 7. Heights at Which Raptors Were Observed, 2011-2015**




Box depicts 25th, 50th (median = large solid line), and 75th percentiles; bar = 90th percentile; dotted line equals mean. TUVU = Turkey Vulture; NOHA = Northern Harrier; SSHA = Sharp-shinned Hawk; COHA = Cooper's Hawk; BWHA = Broad-winged Hawk; SWHA = Swainson's Hawk; RTHA = Red-tailed Hawk; FEHA = Ferruginous Hawk; RLHA = Rough-legged Hawk; GOEA = Golden Eagle; BAEA = Bald Eagle; MERL = Merlin; AMKE = American Kestrel; PRFA = Prairie Falcon; PEFA = Peregrine Falcon; SEOW = Short-eared Owl; GHOW = Great Horned Owl; SNOW = Snowy Owl; BUOW = Burrowing Owl.

**Figure 8. Distances from Point Count Center at Which Raptors Were Observed During 60-minute and 20-minute Point Counts, 2013-2014**




Box depicts 25th, 50th (median = large solid line), and 75th percentiles; bar = 90th percentile; dotted line equals mean; circles indicate 5% & 95% confidence limits; small lines indicate maximum.
TUVU = Turkey Vulture; NOHA = Northern Harrier; SSHA = Sharp-shinned Hawk; SWHA = Swainson's Hawk; FEHA = Ferruginous Hawk; RLHA = Rough-legged Hawk; GOEA = Golden Eagle; BAEA = Bald Eagle; MERL = Merlin; AMKE = American Kestrel; PRFA = Prairie Falcon; PEFA = Peregrine Falcon; BUOW = Burrowing Owl.

**Figure 9. Raptor Nests, Great Blue Heron Rookery, and Loggerhead Shrike Nest Located, 2011-2014 [Scale (1:341,038)]**

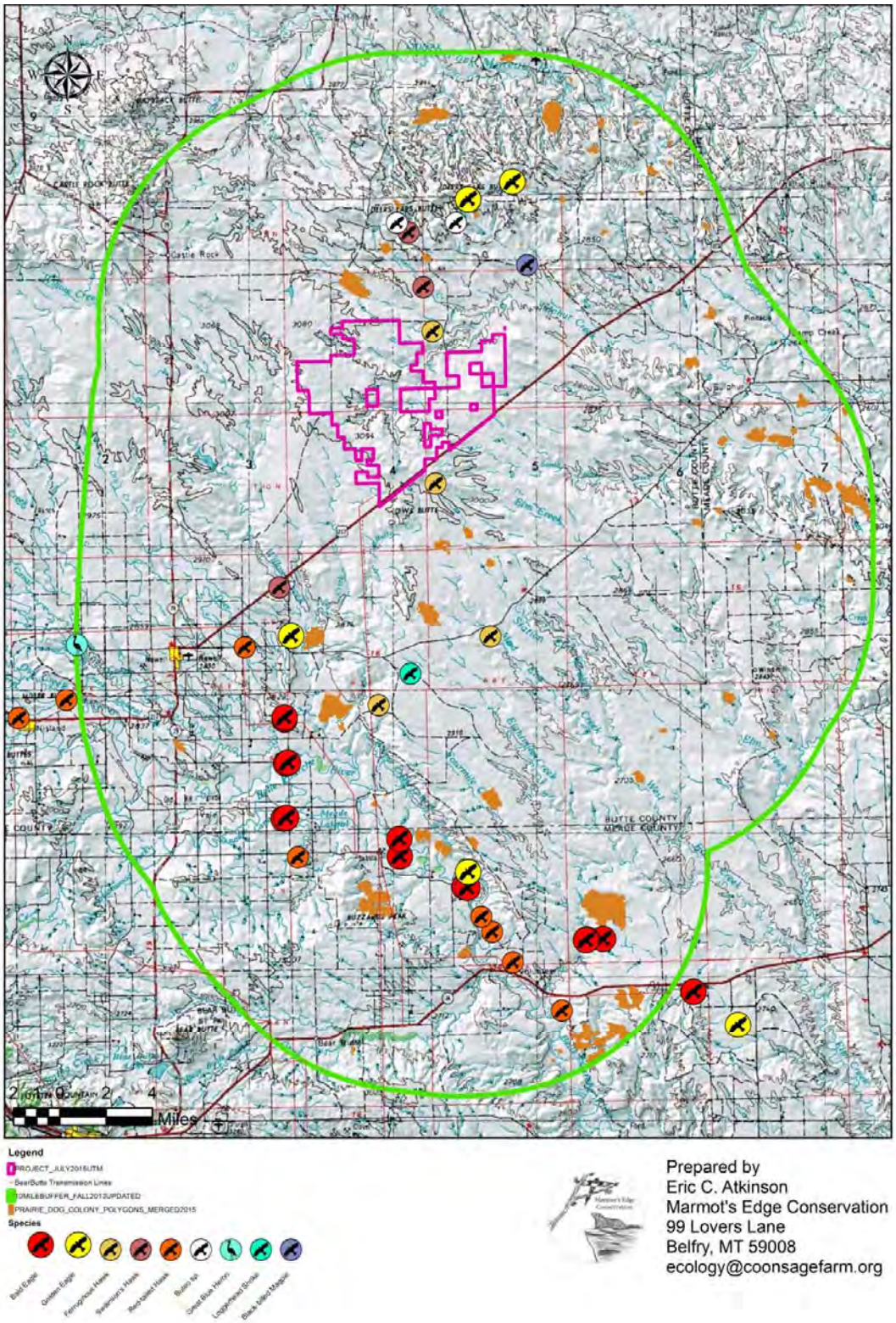
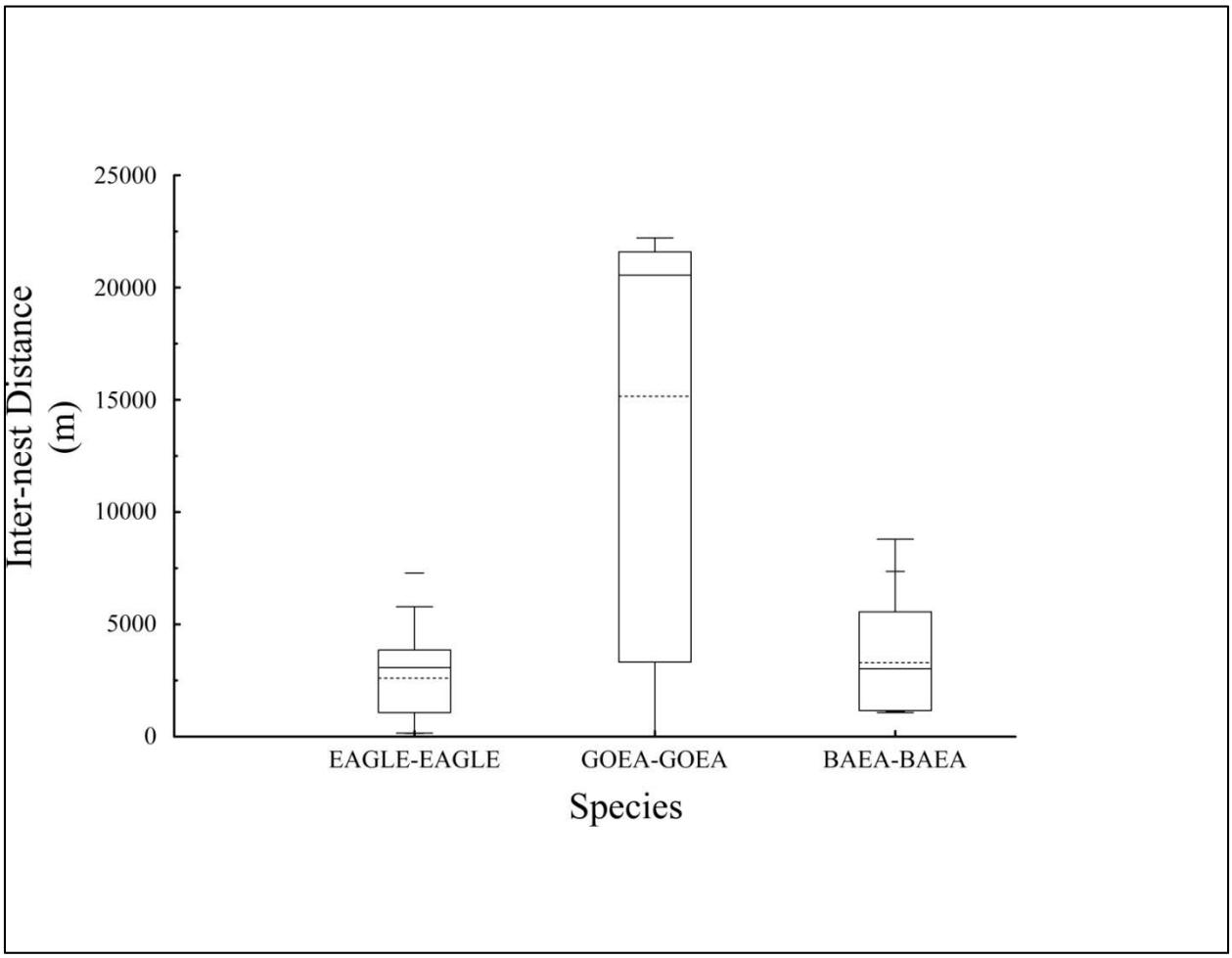


**Figure 10. Inter-nest Distances Observed Among Eight Bald Eagle and Five Golden Eagle Nests**




Nests located in the Project Buffer-Initial and Project Buffer-Final areas; 2011-2014. Dotted line signifies mean distance; solid line represents median value; 25th, 75th and 95th percentiles are also plotted.

The nearest active Golden Eagle nest to the Project Area is situated approximately 9.5 km (5.9 miles ) north within a hardwood draw (Green Ash; *Fraxinus pennsylvanica*) flowing southeastward from Deers Ears Butte. At this writing, the nearest potential wind turbine location is approximately 11.5 km (7.1 miles) southwest of this nest. A second active nest exhibited an incubating subadult (approximately third-year) female in an adjacent hardwood draw to the northeast and approximately 10.6 km (6.6 miles) from the nearest corner of the Project. It should be noted, that at this time, no wind turbines are planned for the Project Area east of Double R Road; the areas closest to these nests. Another Golden Eagle nest was located approximately 10.8 km (6.7 miles) southwest of the Project Area but collapsed during Winter Storm Atlas of October 2013.

Since Ferruginous Hawks and Northern Harriers are the only raptor species likely to nest closely to or within the Project Area (excepting, Short-eared Owls during high microtine cycles), efforts to minimize disturbance to the former will be implemented. Efforts to minimize spatial and

temporal disturbance to any nesting Ferruginous Hawks (1600 m buffer of no construction activity surrounding any active nest between 15 Mar-31 July) will be made (USFWS 2015b). Since planned turbine locations are far-removed from known Burrowing Owl locations at black-tailed prairie dog colonies south of Highway 212, efforts to reduce impact to Burrowing Owl nesting sites likely not necessary.

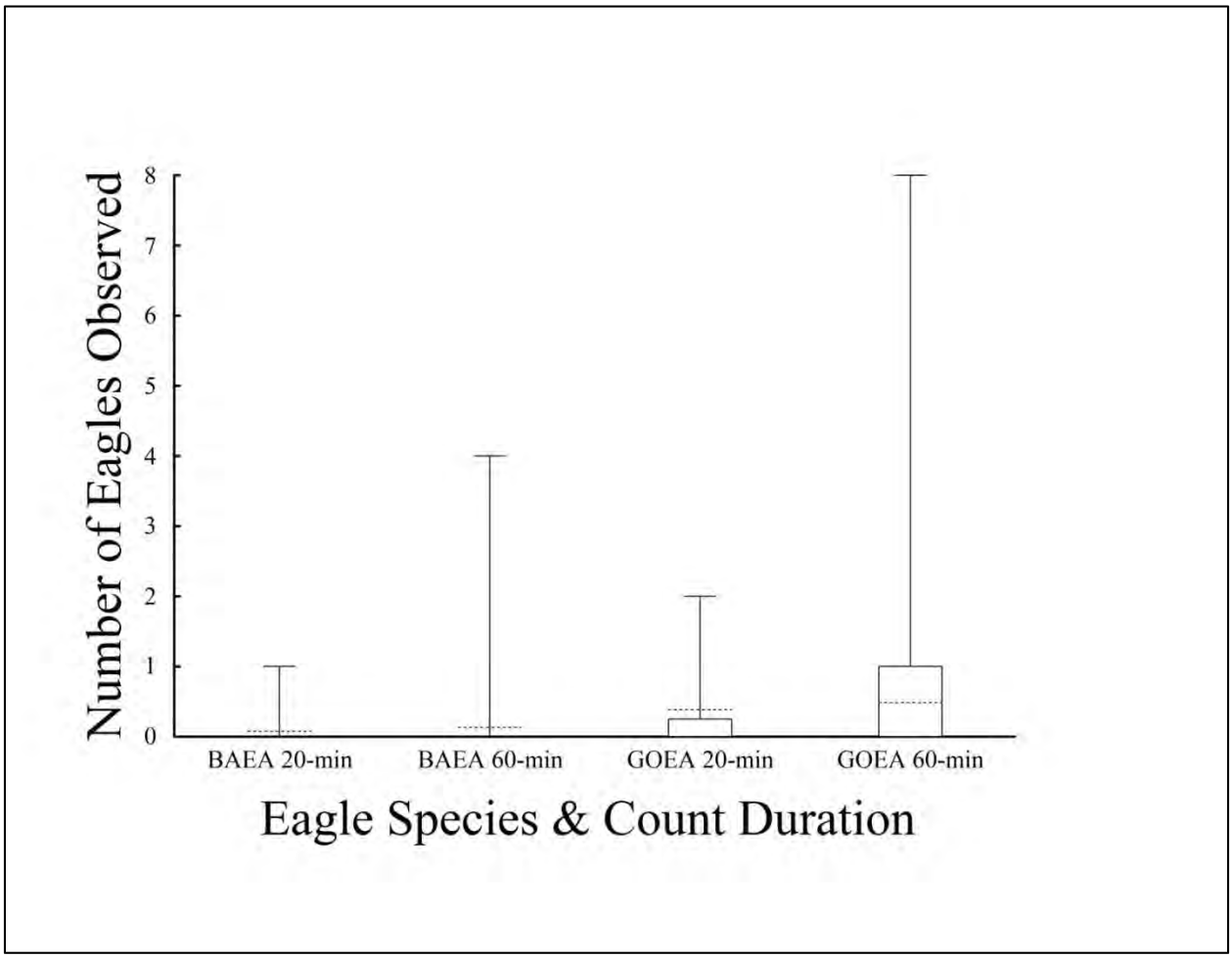
### Bald Eagles and Golden Eagles

Across all surveys within the Project Buffer-Initial, Project Buffer-Final, and Project Area we observed 75 and 122 Bald Eagles and Golden Eagles, respectively (Figure 5). These numbers did not necessarily correspond to individual since resightings of the same birds likely contributed to these numbers. Bald Eagles were observed during all months except May, June, and August, (no surveys were performed in February), whereas we observed Golden Eagles during all months (excepting the nonsurveyed month of February).

Initially in 2011 and 2013, we deployed 20-minute point counts to assess raptor occurrence and distribution across the Project Area (Paprocki *et al*. 2015). In consultation with USFWS and SDGFP, we increased the survey time to 60-minutes. Raptor point counts were deployed in all weather conditions conducive to observing raptors in both flight as well as those perched and were performed during daylight hours. We randomly placed point count locations across the Project Area attempting to locate each centroid at a minimum distance of 2500m from the nearest point count performed on the same day or field trip to increase independence of counts. Due to impassable roads and poor access under certain field conditions, some point counts were revisited more than others but all in all coverage of the Project Area was excellent amounting to 153 60-minute point counts in 2014 preceded by 26 20-minute point counts performed in 2013 (Figure 2).

During 26 20-minute point counts performed in 2013, we observed two Bald Eagles and ten Golden Eagles. In 2014 and 2015 during 153 60-min raptor point counts, we observed 19 Bald Eagles and 71 Golden Eagles. Interestingly, average numbers of eagles observed, both bald and golden, were not significantly different between 20-min counts versus 60 min counts (Bald Eagles, $F_{1,170} = 0.239$, $p = 0.625$; Golden Eagles, $F_{1,170} = 0.242$, $p = 0.624$; Figure 11). We interpret this as an indication that 20-min point counts were indeed adequate to assess abundance of Bald and Golden Eagles in the Project Area. Even though the use of 60-min counts did not increase our estimate precision (Bald Eagle coefficient of variation = 3.53 vs 4.17 ; Golden Eagle cv = 1.96 vs. 2.07 for 20-min and 60-min counts, respectively), the ability to accurately estimate the behavior (i.e., flight time, altitude of flight, and time spent perched) of eagles and other raptors across the Project Area was likely increased.

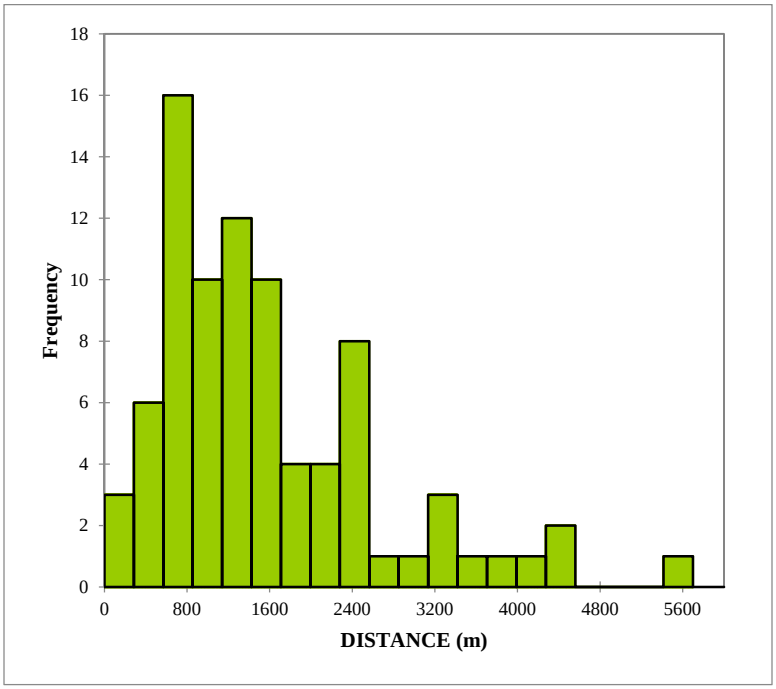
**Figure 11. Numbers of Bald Eagles and Golden Eagles Observed on 20-minute and 60-minute Unlimited Distance Point Counts, 2013 and 2014**




Box depicts 25th, 50th(median), and 75th percentiles; bar = 90th percentile; dotted line equals mean.
BAEA = Bald Eagles; GOEA = Golden Eagles

Eagles were observed between 180 and 5660 m from the point count center. These observation distances followed a Poisson distribution (Figure 12). USFWS (2013) suggested truncating observation distances to 800m but owing to the open, rolling, and easily viewed topography of the Project Area, our data suggest this distance would severely underestimate the eagle numbers and their use of the Project Area. In fact, if we had used only eagles observed within 800 m of the observer, we would have removed over 70% of the individuals from consideration. Hence, when calculating eagle density and estimates of fatality risk to be included in the Bird and Bat Conservation Strategy, we used a point count radius of 4000 m capturing over 95% of the eagle observations. We retained the six eagles observed at distances greater than 4000 m for all calculations.

**Figure 12. Distances at Which Bald Eagles and Golden Eagles Were Observed on 60-minute Point Counts, 2014**




## Prairie Passerines & Other Landbirds

During June 2013 and May and June of 2014, we performed 53 prairie passerine point count surveys enumerating 27 species (Table A-6). Of these 27, 16 were passerines. Not surprisingly, avian diversity in the Project Buffer-Final is low owing to the extremely monotypic nature of local vegetation; prairies dominated almost exclusively by western wheatgrass. Even though some topographical relief does occur in the central portion of the Project Buffer-Final and grazing regimes are relatively diverse, avian habitat diversity is still quite simple. Lark Buntings, Western Meadowlarks, Chestnut-collared Longspurs, Grasshopper Sparrows, and Horned Larks, birds typical of grassland systems, were the most abundant and well-distributed species (Figure 13).

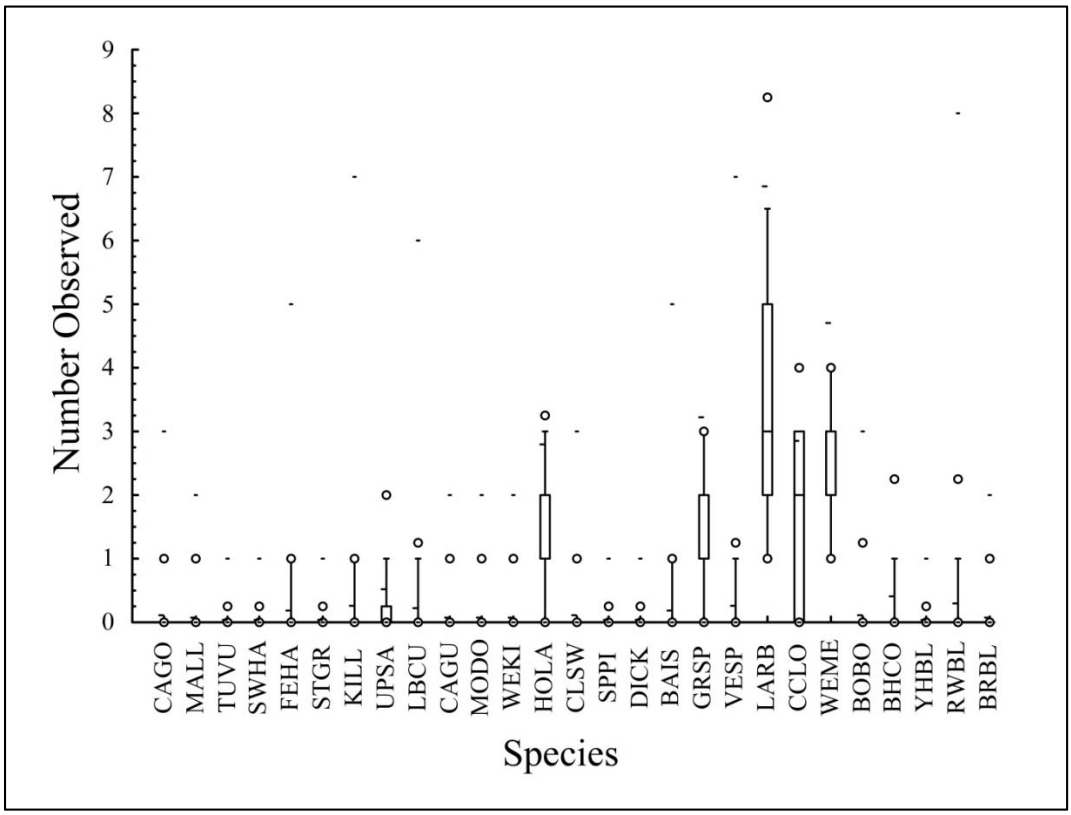
## Table A-6. Results of 53 10-minute Avian Point Counts, 2013-2014

| POINT | CAGO | MALL | TUVU | SWHA | FEHA | STGR | KILL | UPSA | LBCU | CAGU | MODO | WEKI | HOLA | CLSW | SPPI | DICK | BAIS | GRSP | VESP | LARB | CCLO | WEME | BOBO | BHCO | YHBL | RWBL | BRBL | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 98 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 | 0 | 6 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 15 |
| 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 5 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 17 |
| 101 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 | 0 | 5 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 17 |
| 102 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 5 | 3 | 3 | 0 | 1 | 0 | 0 | 0 | 16 |
| 103 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 8 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 15 |
| 106 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 5 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 15 |
| 111 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 5 | 3 | 3 | 0 | 1 | 0 | 0 | 0 | 16 |
| 113 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 5 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 15 |
| 114 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 5 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 13 |
| 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 8 |
| 118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 10 |
| 119 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 6 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 14 |
| 120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 4 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 12 |
| 121 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 11 |
| 122 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 132 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 7 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 13 |
| 133 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 7 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 17 |
| 162 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 13 |
| 163 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 8 |
| 164 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 13 |
| 165 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 9 |
| 168 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 7 |
| 172 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 7 |
| 173 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 9 |
| 177 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 6 |

| POINT | CAGO | MALL | TUVU | SWHA | FEHA | STGR | KILL | UPSA | LBCU | CAGU | MODO | WEKI | HOLA | CLSW | SPPI | DICK | BAIS | GRSP | VESP | LARB | CCLO | WEME | BOBO | BHCO | YHBL | RWBL | BRBL | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 183 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 15 |
| 184 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 13 |
| 186 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 11 |
| 187 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 13 |
| 192 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 6 |
| 193 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 9 |
| 194 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 10 |
| 195 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 11 |
| 403 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 9 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 16 |
| 406 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 4 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 12 |
| 359P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 2 | 1 | 3 | 0 | 2 | 2 | 1 | 0 | 0 | 1 | 15 |
| 359P1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 10 |
| 361P | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 2 | 0 | 1 | 0 | 3 | 0 | 14 |
| 362P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 3 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 13 |
| 364P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 2 | 0 | 1 | 1 | 3 | 0 | 0 | 0 | 11 |
| 364P1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 3 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 11 |
| 364P2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 9 |
| 376P1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 1 | 2 | 0 | 1 | 1 | 0 | 0 | 13 |
| 376P2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 2 | 0 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 14 |
| 376P3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 6 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 13 |
| 376P4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 14 |
| 376P5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 3 | 0 | 1 | 0 | 1 | 0 | 12 |
| 376P6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 7 |
| 396P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 | 0 | 4 | 2 | 4 | 0 | 0 | 0 | 0 | 1 | 16 |
| 397P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 11 |
| 397P1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 13 |
| 397P2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 11 |
| 399P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 11 |
| **Total** | **3** | **2** | **1** | **1** | **5** | **1** | **7** | **14** | **6** | **2** | **2** | **2** | **75** | **3** | **1** | **1** | **5** | **87** | **7** | **185** | **77** | **127** | **3** | **11** | **1** | **8** | **2** | **640** |

CAGO = Canada Goose; MALL = Mallard; TUVU = Turkey Vulture; SWHA = Swainson's Hawk; FEHA = Ferruginous Hawk; STGR = Sharp-tailed Grouse; KILL = Killdeer; UPSA = Upland Sandpiper; LBCU = Long-billed Curlew; CAGU = California Gull; MODO = Mourning Dove; WEKI = Western Kingbird; HOLA = Horned Lark; CLSW = Cliff Swallow; SPPI = Sprague's Pipit; DICK = Dickcissel; BAIS = Baird's Sparrow; GRSP = Grasshopper Sparrow; VESP = Vesper Sparrow; LARB = Lark Bunting; CCLO = Chestnut-collared Longspur; WEME = Western Meadowlark; BOBO = Bobolink; BHCO = Brown-headed Cowbird; YHBL = Yellow-headed Blackbird; RWBL = Red-winged Blackbird; BRBL = Brewer's Blackbird.

**Figure 13. Numbers of Landbirds observed on 10-minute unlimited distance point counts, 2013 and 2014**

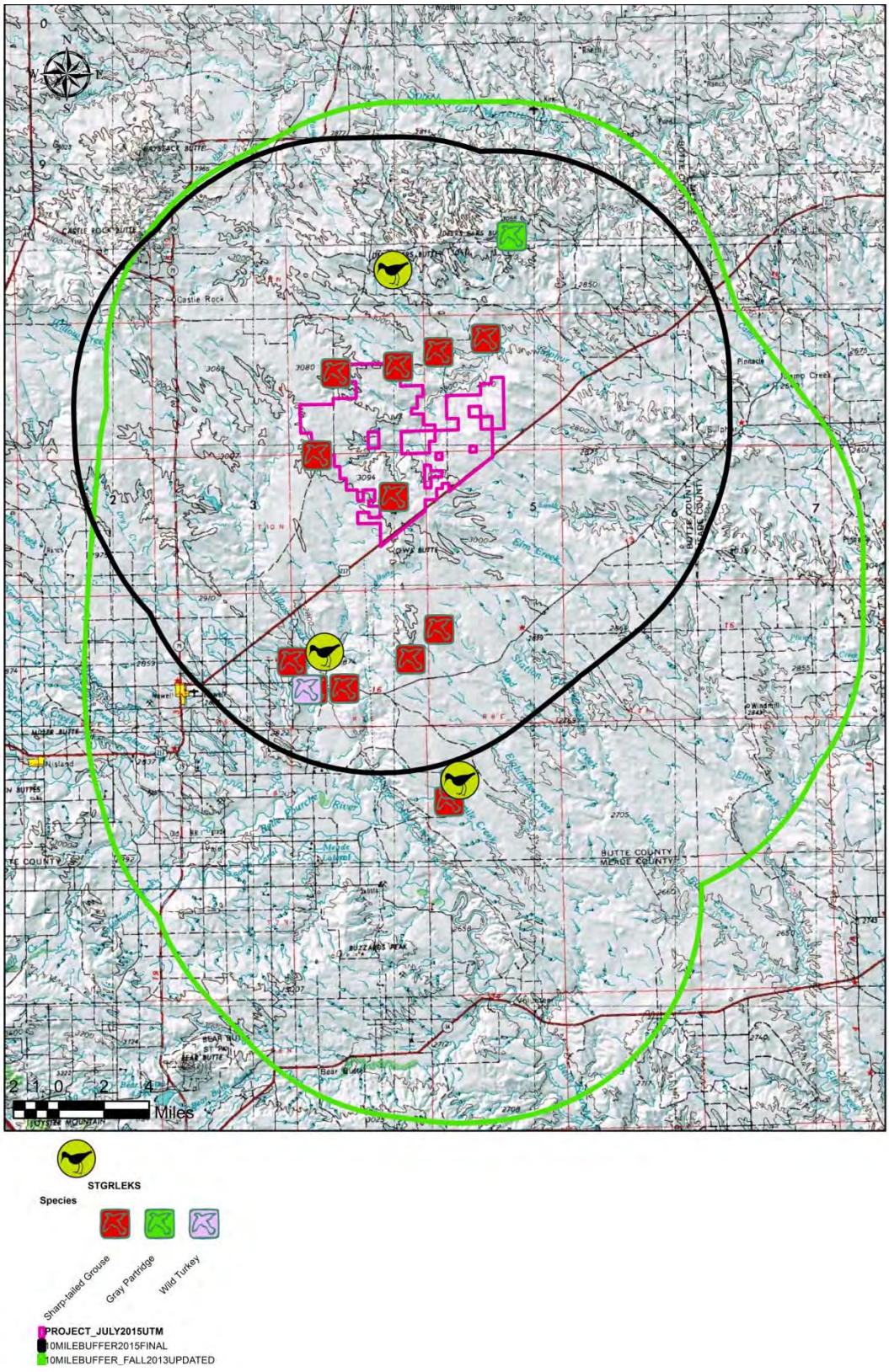



Box depicts 25th, 50th (median = large solid line), and 75th percentiles; bar = 90th percentile; dotted line equals mean; circles indicate 5% & 95% confidence limits; small lines indicate maximum.
CAGO = Canada Goose; MALL = Mallard; TUVU = Turkey Vulture; SWHA = Swainson's Hawk; FEHA = Ferruginous Hawk; STGR = Sharp-tailed Grouse; KILL = Killdeer; UPSA = Upland Sandpiper; LBCU = Long-billed Curlew; CAGU = California Gull; MODO = Mourning Dove; WEKI = Western Kingbird; HOLA = Horned Lark; CLSW = Cliff Swallow; SPPI = Sprague's Pipit; DICK = Dickcissel; BAIS = Baird's Sparrow; GRSP = Grasshopper Sparrow; VESP = Vesper Sparrow; LARB = Lark Bunting; CCLO = Chestnut-collared Longspur; WEME = Western Meadowlark; BOBO = Bobolink; BHCO = Brown-headed Cowbird; YHBL = Yellow-headed Blackbird; RWBL = Red-winged Blackbird; BRBL = Brewer's Blackbird.

## Upland Gamebirds

We encountered three species of upland gamebirds within the Project Buffer-Initial and Project Buffer-Final; Gray Partridge, Sharp-tailed Grouse, and Wild Turkey (Figure 14). Wild Turkeys likely do not breed within the Project Area owing to lack of suitable habitat, whereas Gray Partridges and Sharp-tailed Grouse likely do. We located three Sharp-tailed Grouse leks via both call-route surveys and helicopter survey, but more leks likely exist in the Project Buffer-Final. On 9 July 2015, we encountered three nearly independent young of their year accompanying their mother within the Project. Suitable habitat for lekking displays of Sharp-tailed Grouse occurs throughout the Project Area and efforts will be made to site wind turbines away from established leks (see Bird and Bat Conservation Strategy).

**Figure 14. Upland Gamebird Observations and Sharp-tailed Grouse Leks, 2011-2015 [Scale (1:341,038)]**



## Predators

Likely due to active predator control (one red fox was encountered in a leg-hold trap) predators are relatively scarce across the Project Buffer-Final and encompassing areas. Sheep are pastured across considerable acreage in the Project Area and we observed no coyotes north of Highway 212 (Figure 15). Interestingly, we saw very little evidence of scavenging by mammalian or avian predators on the substantial number of cattle carcasses resulting from the October 2013 Winter Storm Atlas. Eagles were never observed attending carcasses. Red foxes (based upon scat identification) appeared to be the most frequent visitor. Mesopredators such as striped skunks, raccoons, and bobcats inhabit the Project Area with both raccoons and bobcats seeking shelter in the abandoned house considered for operations management. One American black bear was observed in at dusk on 5 September 2015. This individual appeared to be two-year old and was walking slowly southeast and downslope in a drainage leading toward the Project Area from the extreme northwest corner.

## Reptiles and Amphibians

Eight and five species of reptiles and amphibians, respectively, were observed in the Project Buffer-Initial and Project Buffer-Final including three turtle species and five species of snakes. Boreal chorus frogs were the most abundant and well distributed amphibian with males calling throughout the spring, summer, and even fall months wherever standing water was available. Northern leopard frogs were observed in North Fork Double R Creek whereas Great Plains toads and plains spadefoots were heard at stockponds (Figure 16). Many (> 100) blotched tiger salamanders were encountered crossing Highway 212 and dispersed across native prairie on the morning of 31 August 2014. The morning was warm and humid following overnight thunderstorms, hence we were observing the tail end of an "*Ambystoma* night" whereby mole salamanders move to and from breeding ponds and are found in substantial numbers.

**Figure 15. Predator Observations; 2011-2015 [Scale (1:341,038)]**

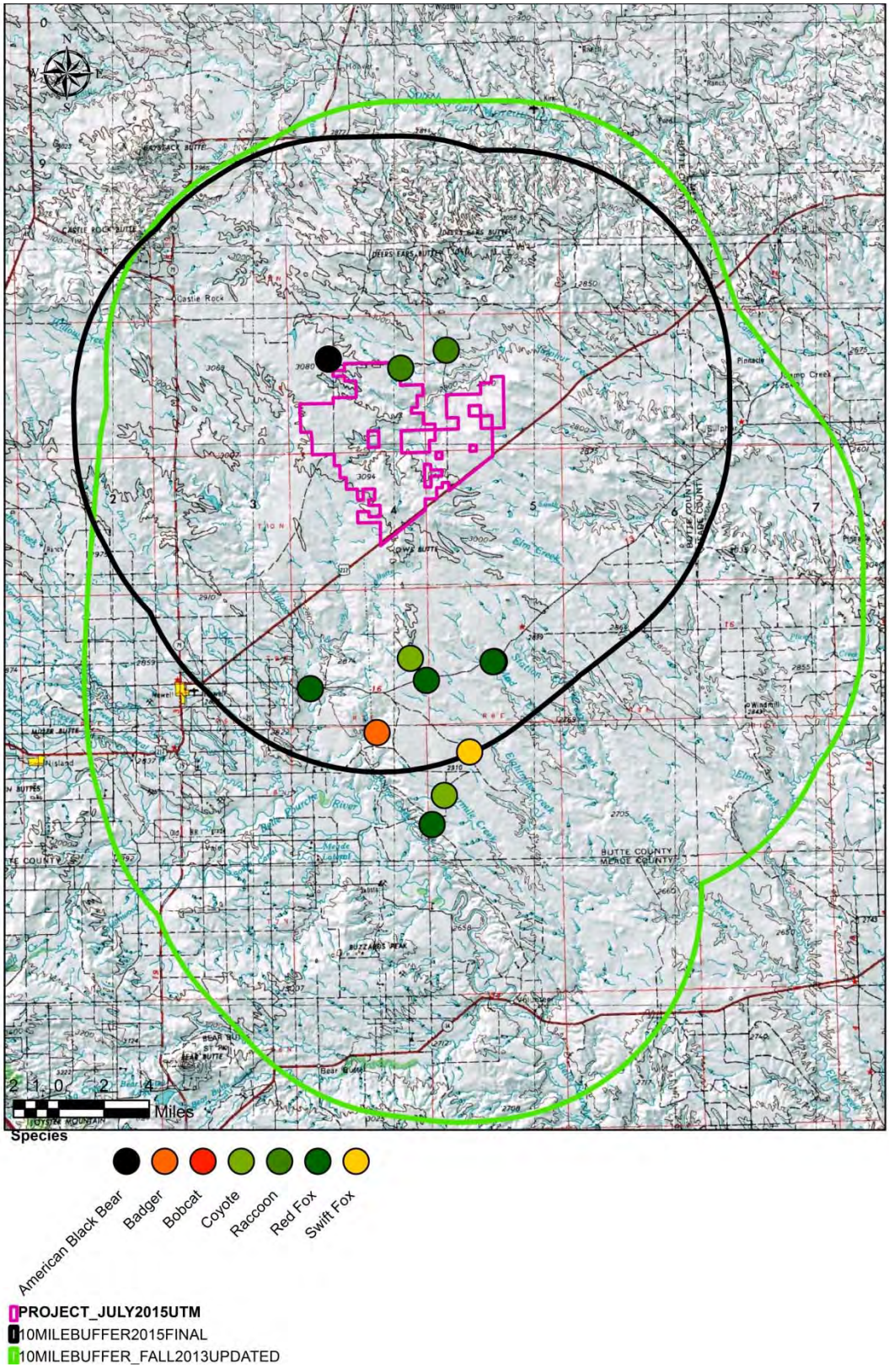
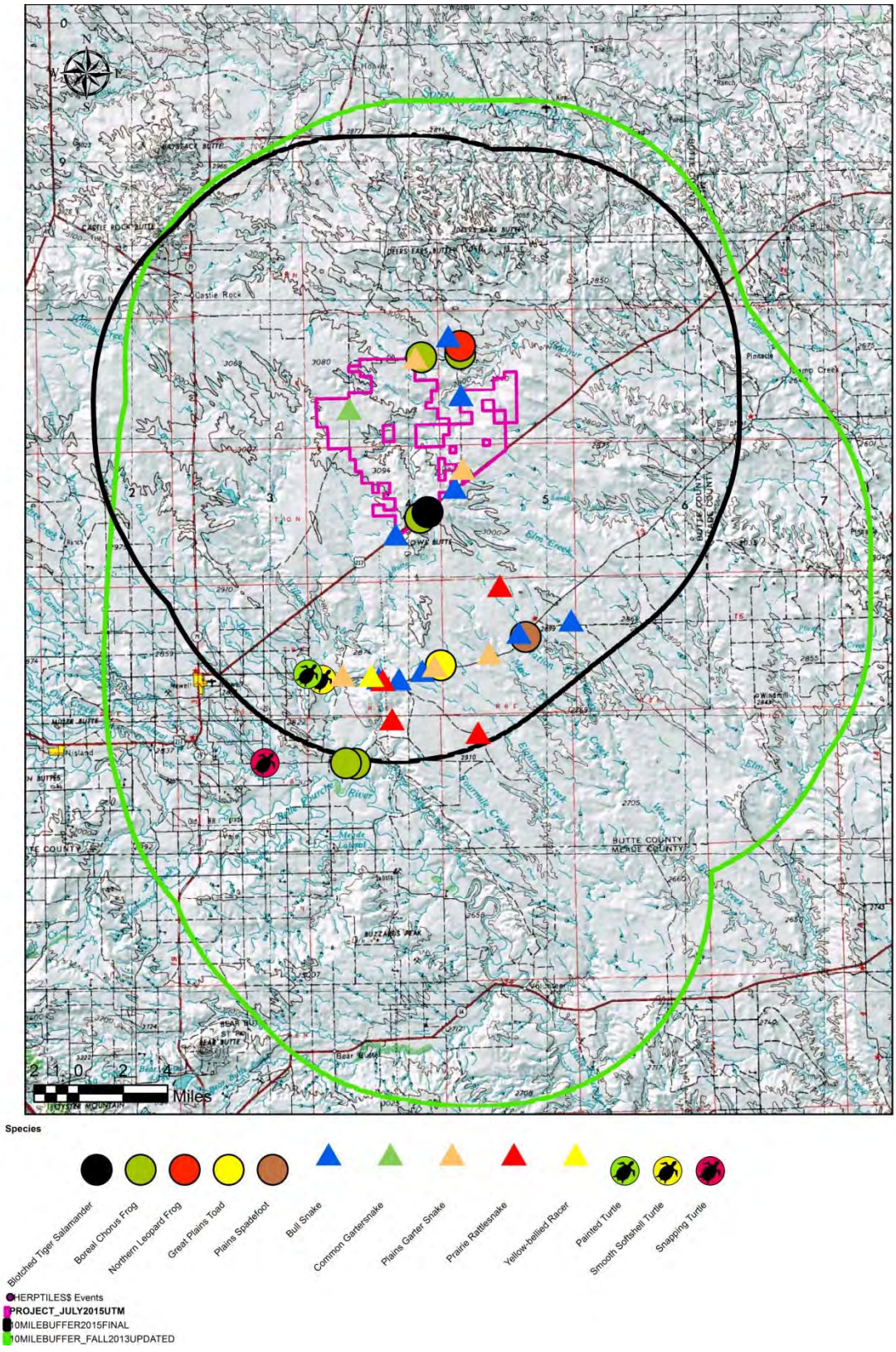


**Figure 16. Reptile and Amphibian Observations; 2011-2015: Boreal Chorus Frogs Range Across the Entire Area [Scale (1:341,038)]**



## Big Game

We observed both white-tailed deer and mule deer in the Project Buffer-Final with these species predominantly observed along drainages such as Willow Creek (Figure 17). Pronghorns, on the other hand, were observed throughout the area at all seasons. Moreover, we noted successful fawning of all three species in the Project Buffer-Final.

## Bats

Initially during July through November of 2014, an Anabat Express automated acoustical bat detector was deployed within the Project Buffer-Final but north and outside of the Project Area in habitat deemed most conducive to encountering bats. This site comprised a permanent open water site (North Fork Double R Creek) supporting various deciduous trees (cottonwoods, peach-leaf willows, and Russian olives). In the summer of 2015, we deployed this detector within the Project Area among the only trees contained within the Project Area, namely a decadent shelterbelt of Siberian elm, Siberian peashrub (*Caragana arborescens*), and Russian olive (Figure 4).

During 2014, we recorded over 15,000 passes of bats but no passes were identified as northern long-eared bat vocalizations (Bryce Maxell, Montana Natural Heritage Program, pers. communication, 21 September 2015; Figure 18). Long-eared Myotis (*Myotis evotis*) [not to be confused with Northern Long-eared Myotis (M. *septentrionalis*)], possibly Fringed myotis (*M. thysanodes*), little brown bats (*M. lucufugus*), unidentified *Myotis* spp., big brown bats (*Eptesicus fuscus*), and hoary bats (*Lasiurus cinereus*) have been detected north of the Project Area. However, 129 nights of acoustical recording within the Project Area in 2015 yielded only four bat detections; two likely Long-eared Myotis and two of an unidentified, but non-northern long-eared bat, *Myotis* sp (Bryce Maxell, Montana Natural Heritage Program, pers. communication).

**Table A-7. Bat Calls Encountered at a Permanent Impoundment of North Fork Double R Creek North of Project Area (July-November 2014, via Anabat Express Bat Detector)**

| Species | Number of Passes | Number of Calls |
|---|---|---|
| All Bats | 15628 | 71681 |
| Long-eared Myotis (*Myotis evotis*) or potentially Fringed Myotis (*M. thysanodes*) | 6876 | 14360 |
| Little Brown Bat (*Myotis lucufugus*) | 469 | 2986 |
| Big Brown Bat (*Eptesicus fuscus*) | 4 | 21 |
| Hoary Bat (*Lasiurus cinereus*) | 6 | 29 |
| Unidentified *Myotis* | 8273 | 54286 |

**Figure 17. Big Game Observations 2011-2015 [Scale (1:341,038)]**

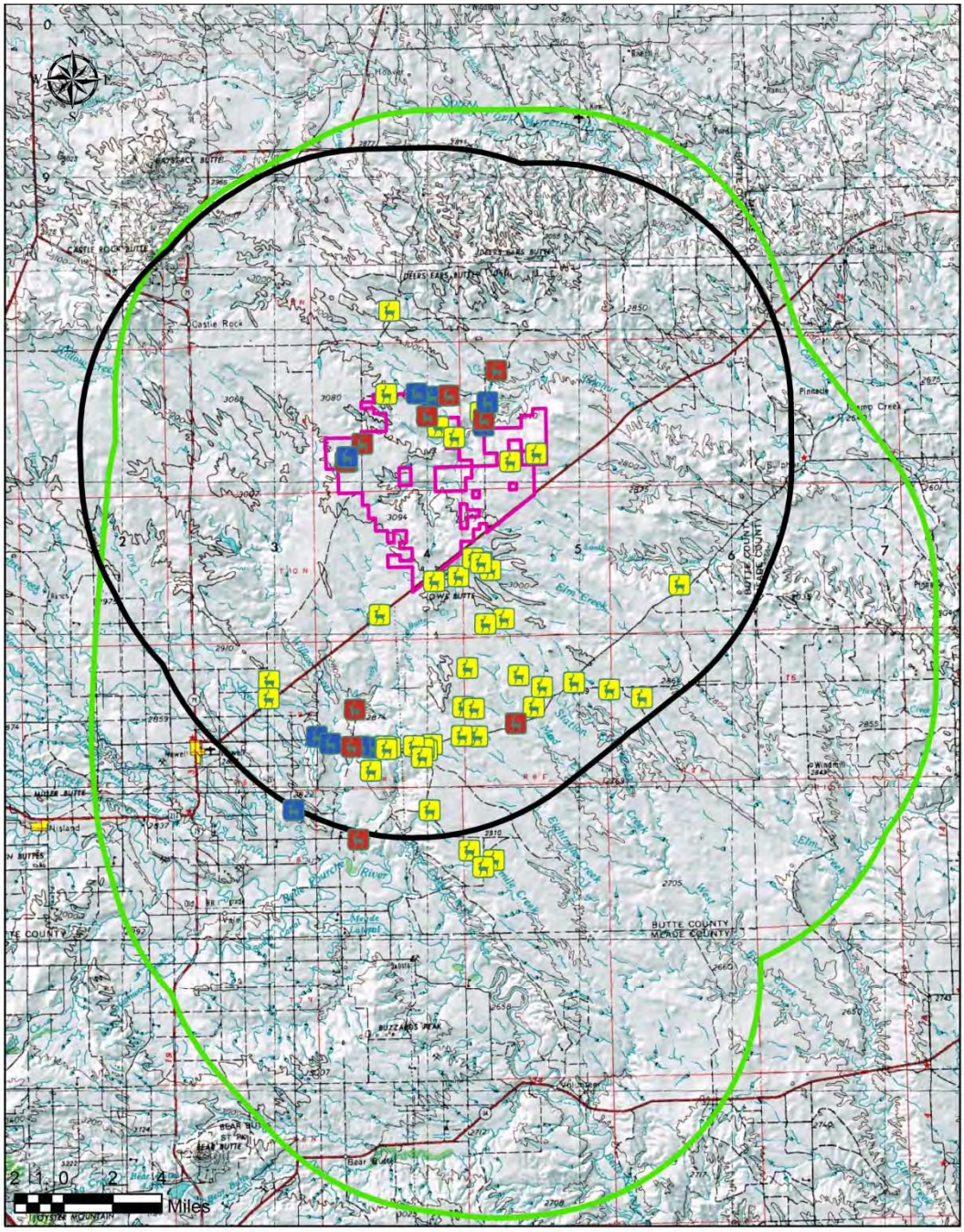
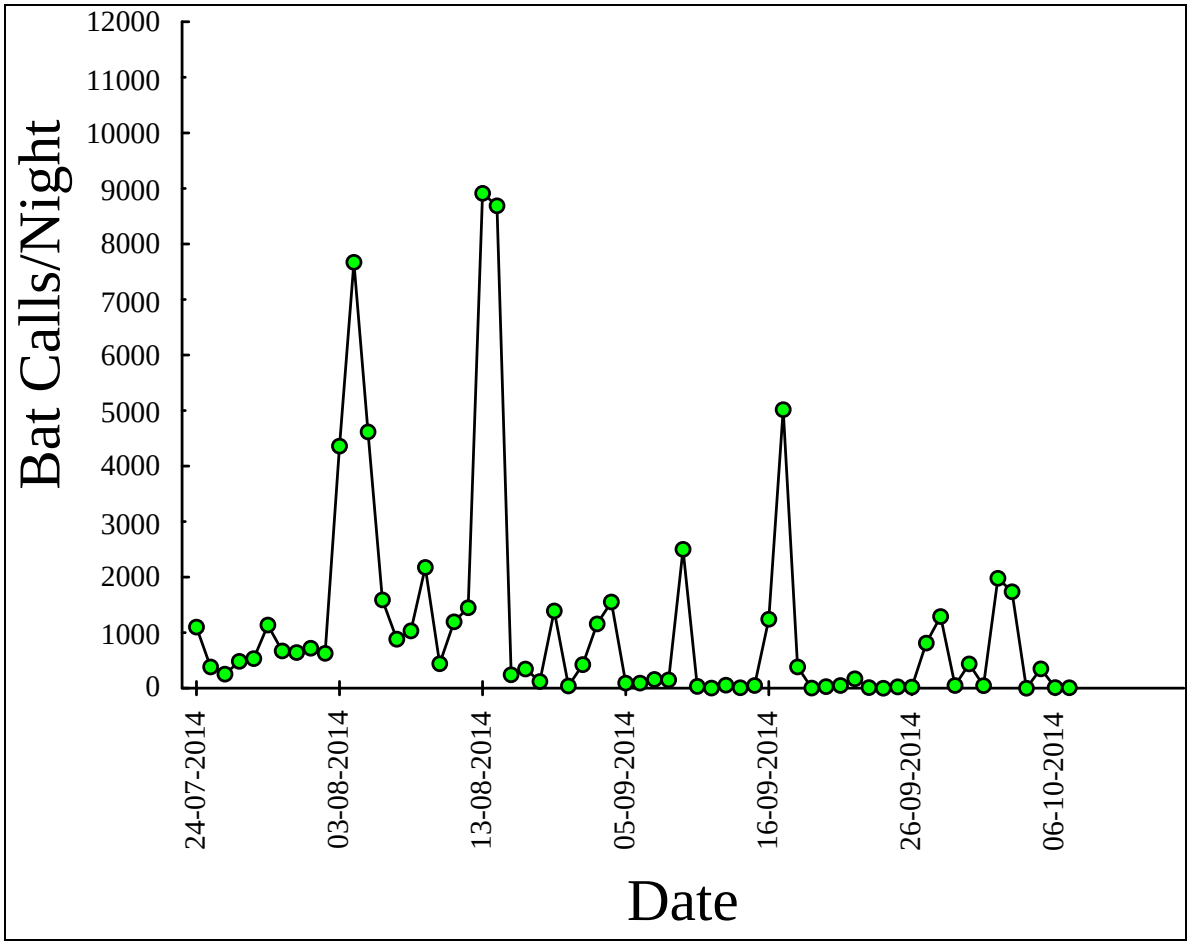


**Figure 18. Temporal Distribution of Bat Calls**




Bat calls recorded via Anabat Express bat detector outside the Project Area on North Fork Double R Creek, 2014. Unit was deployed 24 July-8 November 2014.

## Sensitive Terrestrial Species

Other than Sprague's Pipit, federally listed or candidate species were not confirmed in the Project Area (Figures 19 and 20). Whooping Cranes were observed in 1972 on two occasions to the northeast of the Project Area (Figure 19, Table A-8, Appendix A-3). For Sensitive raptors, only Ferruginous Hawk breeding activity has been documented within the Project Area; but both Bald Eagles and Golden Eagles fly over, forage within, and perch within the Project Area. Twenty rare species (Tracked by the South Dakota Natural Heritage Program; http://gfp.sd.gov/wildlife/ threatened-endangered/rare-animal.aspx#sthash.8pmWPT98.dpuf) were observed during surveys across the Project Buffer-Initial, Project Buffer-Final, and Project Area (Figure 20, Table A-9). Since nesting structures (trees, platforms, rocky outcrops, cliffs, and high cutbanks) are nonexistent within the Project Area, it is not anticipated that any eagle nests will be encountered in the future. Construction and maintenance personnel will be asked to report any observations of eagles.

**Table A-8. Rare Species Locations Retrieved from the South Dakota Natural Heritage Database Project Buffer-Final, 22 July 2015**

| Species | Number of Records |
|---|---|
| Mountain Sucker | 1 |
| Spiny Softshell Turtle | 2 |
| Short-horned Lizard | 1 |
| Great Blue Heron | 4 |
| Swainson's Hawk | 4 |
| Ferruginous Hawk | 1 |
| Golden Eagle | 3 |
| Bald Eagle | 5 |
| Whooping Crane | 2 |
| Long-billed Curlew | 4 |
| Burrowing Owl | 9 |
| Northern Mockingbird | 1 |
| Swift Fox | 1 |

**Table A-9. Rare Species Encountered Within the Project Buffer-Initial, Project Buffer-Final, and Project Area; 2011-2015**

| Species | Number observed |
|---|---|
| Great Plains Toad | 1 |
| Smooth Softshell Turtle | 1 |
| Snapping Turtle | 1 |
| Great Blue Heron | 1 |
| Swainson's Hawk | 32 |
| Ferruginous Hawk | 121 |
| Golden Eagle | 112 |
| Bald Eagle | 73 |
| Peregrine Falcon | 2 |
| Prairie Falcon | 25 |
| Long-billed Curlew | 17 |
| Burrowing Owl | 26 |
| Loggerhead Shrike | 11 |
| Sprague's Pipit | 59 |
| Baird's Sparrow | 5 |

| Species | Number observed |
|---|---|
| Chestnut-collared Longspur | 38 |
| Bobolink | 1 |
| Black-tailed Prairie Dog | 29 |
| Bobcat | 1 |
| Swift Fox | 4 |

### Greater Sage-Grouse

Specific surveys were conducted for both leks and dispersed Greater Sage-Grouse in conjunction with those performed for Sharp-tailed Grouse. Owing to a general lack of suitable habitat for the former in the surrounding area, let alone the Project Area itself, we were not surprised when we did not encounter any individuals of this species. Big sagebrush, when present in the Project Area, is short (i.e., <30 cm height) and well dispersed (<10 % ground cover), providing unsuitable habitat for this species (Connelly *et al*. 2004, Hagen et al. 2007). Approximately six kilometers to the north and west of the Project Area some small stands of big sagebrush, are present but even these provide poor Greater Sage-Grouse habitat. Sharp-tailed Grouse, a gallinaceous bird preferring more grassland cover, are present and do breed in the buffer zone surrounding the Project Area. Continued vigilance for the presence of dispersing Greater Sage-Grouse should be continued but impacts to this species due to Project construction, installation, and operation are not likely due the lack of any suitable habitat within the Project Buffer-Final.

### Red Knot

No Red Knots were observed during migration monitoring throughout the Project Area. Suitable stopover habitat is rare here. Excluding vagrants, Red Knots generally follow coastal migration routes both northward and southward (Baker *et al*. 2013). Project impact to this species during construction, implementation, and operation will likely be nonexistent.

### Sprague's Pipit

Breeding by Sprague's Pipits in or adjacent to the Project Area was not confirmed. However, two individuals were detected during breeding season avian point count surveys (May 2014, only) and one potential young of the year was observed in July of 2011. These individuals were observed approximately seven miles south of the Project Area. The individuals observed in May 2014 appeared to be moving northward through the Project Buffer-Final; in other words, they appeared to be migrating. During August and October 2014, 43 Sprague's Pipits in 17 groups were observed migrating southeasterly through the Project Area and Project Buffer-Final. During September 2015, 13 Sprague's Pipits were observed in seven hours of raptor counts. Across these observations, pipits were observed settling in or flushing from grasslands on ridgelines from/to flight heights lower than 20 m above the ground. Residence time by these specific individuals was short (generally less than 10-min), hence, the importance of the Project Area for migratory refueling by Sprague's Pipits is unknown. Again, active breeding by Sprague's Pipits in the Project Area was not documented likely due the preponderance of relatively poor quality

habitat. Sprague's Pipits have been shown to select habitat that varies across the geographical range of their breeding habitat (Jones 2010). Generally, in areas of North Dakota and Montana, pipits avoid nonnative grasslands preferring to breed in native stands. Furthermore, areas of high vegetation species diversity, moderate height, and low bare ground cover are selected. Project Area habitat shows little grass species diversity, significant non-native species invasion, and with bare ground coverage often exceeding 15%, characteristics generally avoided by Sprague's Pipits (Davis *et al*. 2014, Jones 2010, Sutter 1997).

Little information exists to adequately assess the impact of wind power development on Sprague's Pipits (Martin *et al*. 2009, Jones 2010, Davis *et al*. 2014, American Bird Conservancy 2015). Studies of oil and gas development show pipits negatively responding to oil pad and access roads (references within Davis *et al*. 2014), but the same has not yet been shown for wind power developments. Hence, pre-construction surveys targeted at the proposed turbine sites themselves in addition to portions of the overall project footprint may be implemented in consultation with regulatory agencies to adaptively manage for this songbird, if warranted.

### Whooping Crane

From 2011-2015, no Whooping Cranes were observed during field surveys of the Project Area and buffered area. In data provided by the South Dakota Natural Heritage Database two Whooping Crane records were present comprising up to three (likely two) individuals. All records occurred within one month's timeframe in the fall of 1972. On 18 September 1972, one bird was observed approximately 4 km (2.5 miles) northeast of the Project Area; two cranes were seen 10 October 1972 approximately 24 km (15 miles) to the east of the Project Area. An additional record was garnered from USFWS (http://ecos.fws.gov/speciesProfile/profile/countiesByState?entityId=67&state=South%20Dakota) and entailed an observation of two Whooping Cranes approximately 5.5 miles west of Belle Fourche. These birds were observed on 31 October 2004 and 1 November 2004, approximately 36 miles (58 km) southwest of the Project Area.

Little suitable stopover habitat is present in the Project Area, however, it has been noted that Whooping Cranes show very opportunistic use of small wetlands and agricultural lands during migration (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2005). Approximately 68 livestock water impoundments exist within the project (one of which maintains permanent water content), but each of these provides little foraging habitat appropriate to Whooping Cranes (Urbanek and Lewis 2015). Overall, only three wetlands (of the 121 identified within the Project Area) contain permanent water and are likely of little value to autumnally migrating Whooping Cranes (Table A-10). Water bodies in the Project Buffer-Final are generally impoundments nestled within drainages providing little visibility, with two notable exceptions. These ponds are impoundments of Double R Creek and sit approximately 5 km (3.25 miles) north of the Project. This said, the Project Area lies outside of the ninety-five percent Whooping Crane migration corridor (U. S. Fish and Wildlife Service 2009, Western Area Power Administration 2015c). Hence, it is predicted that the project will have no impact on Whooping Cranes due to the lack of

habitat and due to the bulk of Whooping Crane migration occurring further east (Tacha *et al*. 2010, Urbanek and Lewis 2015).

**Figure 19. Rare, Threatened, and Endangered Species Locations Received from South Dakota Natural Heritage Database, 22 July 2015 [Scale (1:341,038)]**

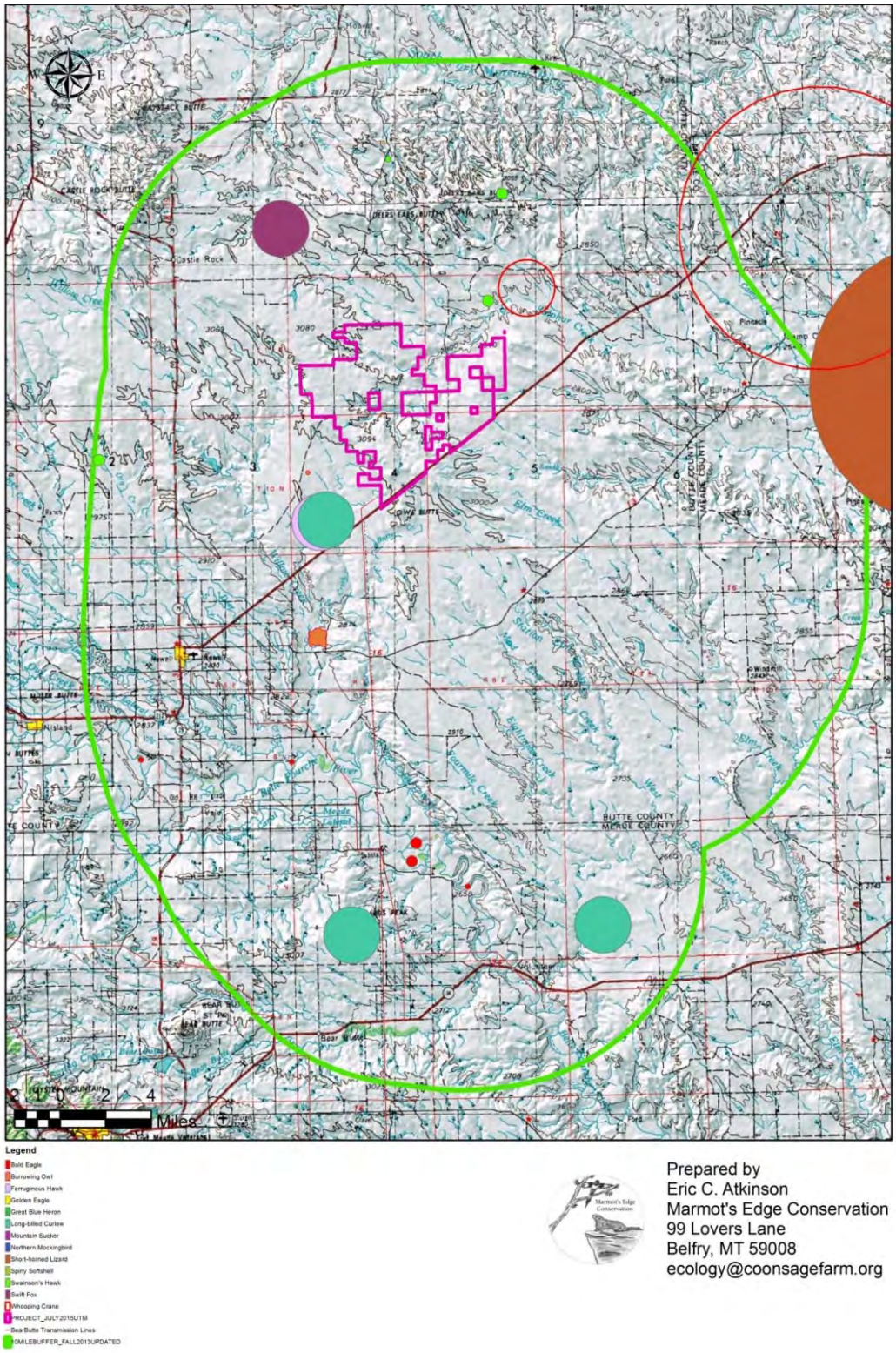



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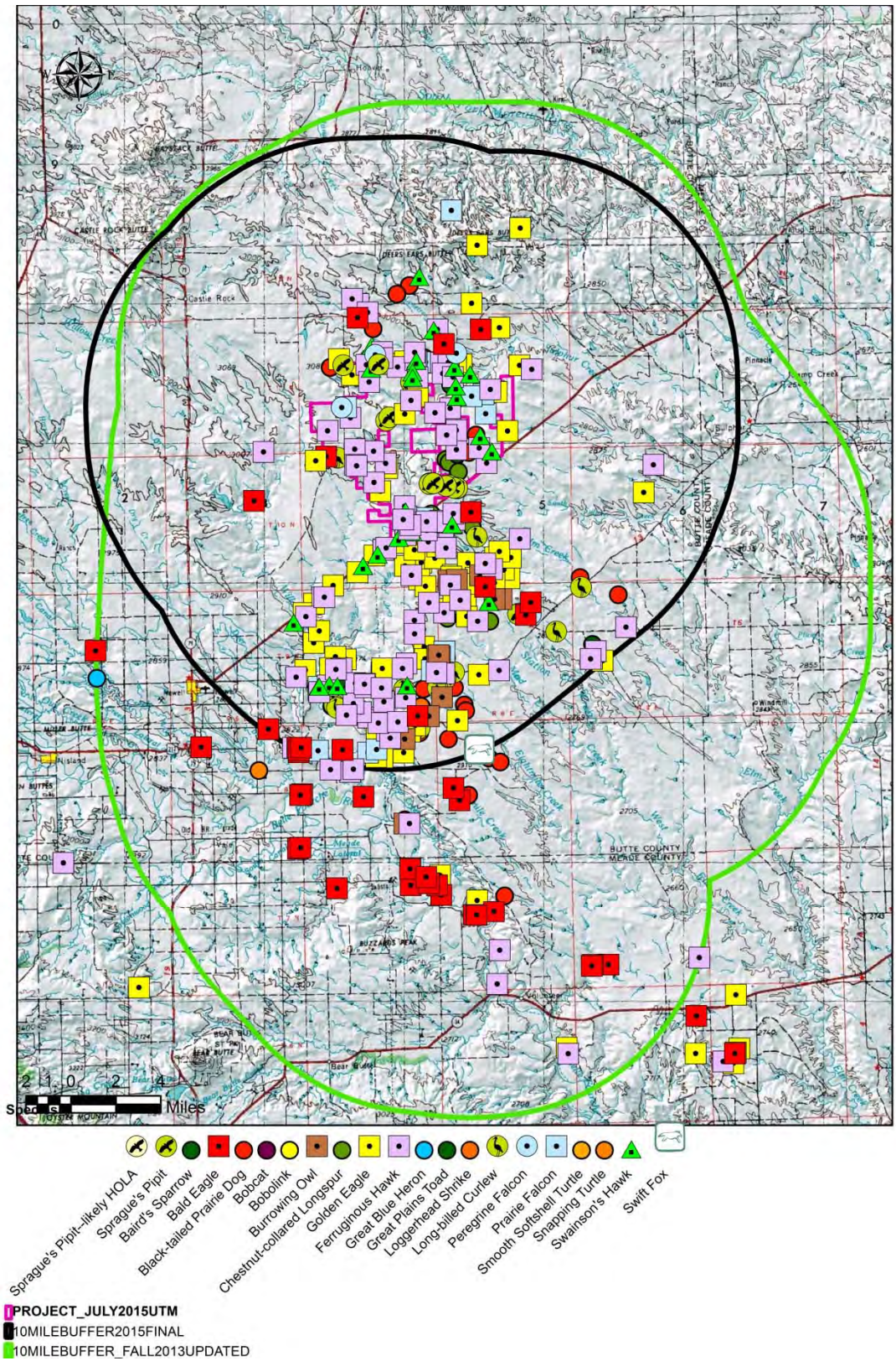
**Figure 20. Observations of Rare Species, 2011-2015 [Scale (1:341,038)]**



## Table A-10. NWI-identified wetlands within the Project Area

| VEG CODE | NUMBER | Mean size (acres) | SD | SUM | Description | Notes |
|---|---|---|---|---|---|---|
| PABFh | 38 | 2.4 | 3.0 | 91.4 | Palustrine aquatic bed semipermanently flooded impounded | Aquatic bed includes wetlands containing plants that grow principally on or below the water surface for most of the growing season |
| PEMA | 18 | 5.2 | 7.4 | 92.8 | Palustrine emergent temporary flooded | Surface water presence is generally short term duration. Hydrophytes may be variable in their presence and replaced by upland plants. |
| PEMAd | 4 | 8.5 | 7.3 | 33.8 | Palustrine emergent temporary flooded partially drained | |
| PEMAh | 11 | 0.6 | 0.7 | 6.6 | Palustrine emergent temporary flooded impounded | |
| PEMC | 8 | 3.4 | 5.4 | 27.2 | Palustrine emergent seasonally flooded | Surface water presence generally longer than for PEMA, gone by season's end; more hydrophytes generally present. Water table varies in depth. |
| PEMCd | 2 | 3.7 | 2.8 | 7.4 | Palustrine emergent permanently flooded partially drained | |
| PEMCh | 12 | 1.2 | 1.2 | 14.5 | Palustrine emergent seasonally flooded impounded | |
| PEMFh | 1 | 17.8 | . | 17.8 | Palustrine emergent permanently flooded impounded | |
| PUBFx | 6 | 0.3 | 0.2 | 2.0 | Palustrine unconsolidated bottom semipermanently flooded excavated | |
| PUSAh | 4 | 1.6 | 1.5 | 6.6 | Palustrine unconsolidated shore temporary flooded impounded | |
| PUSC | 3 | 8.0 | 13.8 | 24.0 | Palustrine unconsolidated shore seasonally flooded | |
| PUSCh | 14 | 1.7 | 2.3 | 23.8 | Palustrine unconsolidated shore seasonally flooded impounded | |

Source: http://ecos.fws.gov/ipac/project/DVW7VJYRAJFXZJBLBKK73P7JA4/resources. Accessed 27 September 2015.

## Northern Long-eared Bat

Roosting and high quality foraging habitats are lacking for northern long-eared bats in the Project Area. Furthermore, no northern long-eared bats have been observed during substantial acoustical and mist-netting surveys throughout western South Dakota over the past few years (Bachen and Maxell. 2014; Bryce Maxell, Montana Natural Heritage Program, pers. communication, 21 September 2015). Approximately 10 km (6 miles) to the north of the Project Area potential roosting and/or hibernacula habitat may be present in the form of hardwood draws and caves and/or crevices in rocky outcroppings and faces. Considerably higher quality foraging and roosting habitat for this species is found approximately 20 km (12.5 miles) south of the Project Area along the Belle Fourche River. The nearest documented hibernaculum for this species is near Hill City in the Black Hills, approximately 105 km (65 miles) south of the Project Area. Passive acoustical surveys (Anabat) deployed at a permanent water body containing emergent vegetation (*Typha latifolia*) and peach-leaf willows (*Salix amygdaloides*) north of the Project Area failed to detect northern long-eared bat calls (Figure 4). Analyses of Project Area recordings for summer and fall of 2015 detected no northern long-eared bat calls, low bat calls overall with four calls detected in 129 nights of observation. Post-construction mortality monitoring will be performed at the site.

# EAGLE FATALITY ESTIMATES

## Eagle Fatality Estimates—a Description of Methodology and Applicability

Based upon our 153 hours of raptor point count observations in which we encountered 19 Bald Eagles and 72 Golden Eagles (91 total) we developed project specific and turbine specific estimates of eagle fatality by total eagles and independently by species. We followed the guidelines and calculations provided by Chamberlain *et al*. (2006), Eichhorn *et al*. (2012), Ocotillo Express, LLC. (2012), Tucker (1996), and USFWS (2011, 2013). Initially, mean values of minutes that eagles spent in flight at heights below 200 m were generated. Two hundred meters follows suggestions by USFWS (2013) and captures the stature of the wind turbines chosen for this project (Siemens 2.3-108). We calculated several different values of eagle fatality based upon various point count radii including low, mean, 95% CI (corresponding to 4000 m count radius), and high estimates. As mentioned previously, an 800m point count radius foreshortened our data pool removing approximately 75% of all eagle observations (Figure 11). Our data show that the use of this areal calculation greatly and inaccurately increased the eagle density estimates produced if using all eagle observations whereas the use of only 25% of eagle observations underestimated abundance and of eagles in the Project Buffer-Final. Hence, we feel most confident with the mean and 95% CI radii estimates (corresponding to point count circles with 1565 and 4000 m radii, respectively) that yield intermediate values of predicted eagle fatality rates (Table A-11; Figure 21). Ultimately, estimates for total eagle (both Bald Eagles and Golden Eagles, combined) fatalities per year range from 0.0020 – 0.0993, with our most confident estimates equal to 0.0259 (mean estimate) and 0.0040 (95% CI estimate). For Bald Eagles, estimates ranged from 0.0069-0.3455 (0.0903 and 0.0138, mean and 95% CI, respectively) whereas Golden Eagle yearly fatality estimates ranged from 0.0327-1.6375 (0.4279 and 0.0655, mean and 95% CI, respectively). Furthermore, when we applied a relatively conservative behavioral avoidance probability of 95% and extended the estimate to a 30-year project life, our estimates of eagle fatalities ranged from 0.6 to just less than three (3). Based upon mean and 95% CI calculations, we estimated that between 0.0207 and 0.1354 Bald Eagles and 0.0983-0.6418 Golden Eagles could experience mortality in 30 years of operation of the Willow Creek Wind Power Facility.

Eichhorn *et al*. (2012) estimated probability of raptor collision with wind turbines by

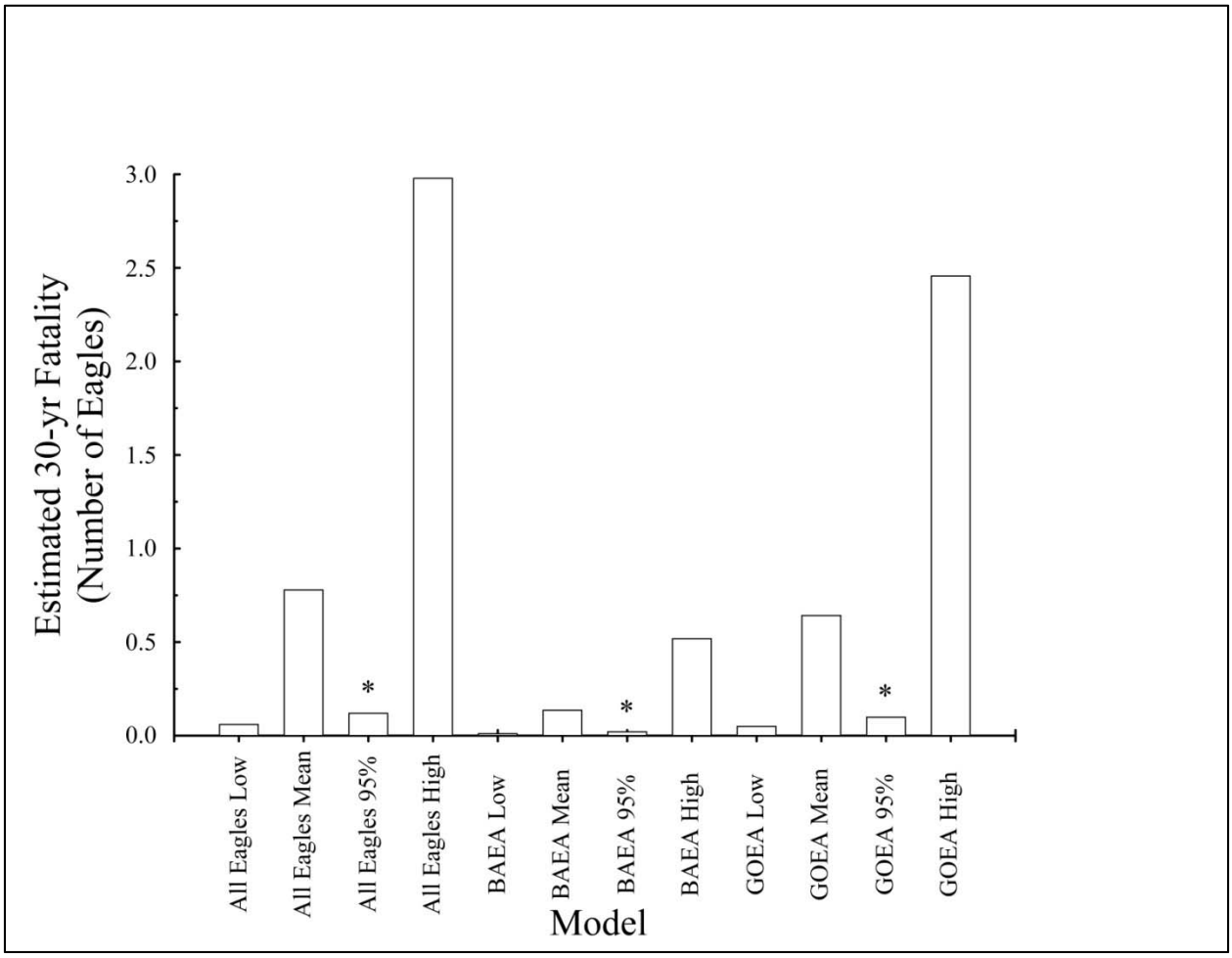
$$p_{col} = p_{fh} * p_{rsa} * p_{BAND} * (1 - p_{av})$$

Where

$$p_{rsa} = \frac{\pi * r^2}{2r * w} = 0.65$$

These parameters were used in the above model.

**Figure 21. Graphical Representation of Estimated 30-year Eagle Fatality by Model**




Asterisks denote models in which we are most confident. BAEA = Bald Eagles; GOEA = Golden Eagles. Please see text for methodology as well as Table A-11.

The proposed Willow Creek Wind Power Facility is situated within Bird Conservation Region (BCR) 17 (Badlands and Prairies). BCR17 encompasses 141960 square miles estimated to contain approximately 7800 Golden Eagles for an average density of 0.0549 Golden Eagles/square mile (USFWS 2013). Hence, if Golden Eagles were indeed killed during operation of this facility, the estimated effect on the midcontinental breeding population of Golden Eagles would likely be minimal. Certainly, however, local nesting pairs may be negatively impacted by the project and conservation and mitigation efforts should be deployed to reduce this risk.

The Project Area qualifies for Category 3—Minimal Risk to Eagles—per USFWS (2013). Specifically, eagle densities are low in and around the Project Area and estimated fatality rates are low, hence verifying a Category 3—Minimal Risk to Eagles. Following USFWS (2013):
A project qualifies for Category 3 if it:

(1) has no important eagle use areas or migration concentration sites within the project area;
(2) and has an annual eagle fatality rate estimate of less than 0.03;
(3) and causes cumulative annual take of the local-area population of less than 5% of the estimated local-area population size.

For the Willow Creek Wind Power Project specifically,

(1) There are no eagle concentrating features or migratory flyways within the Project Area [i.e., no roosts nor roosting habitat, no prey concentrations (no black-tailed prairie dog colonies remain in the Project Area as the project footprint was moved to avoid existing colonies), no nesting structures are present, no domestic sheep lambing grounds are present, no deciduous and/or conifer dominated riparian zones are present, and no important migratory corridors exist within the Project Area],

(2) Species-specific annual fatality rates are low; all below 0.03 eagles killed per year (Table A-11).
   a. Bald Eagle mean estimated annual mortality rate equals 0.0045 eagles/year;
   b. Golden Eagle mean estimated annual mortality rate equals 0.0214 eagles/year;
   c. Total eagle mean estimated annual mortality rate equals 0.0040 eagles/year. These estimates are based upon a 95% behavioral avoidance estimate versus a 99% avoidance rate (USFWS 2013), yielding an increased risk estimate to include somewhat of a buffer.

(3) Estimated cumulative annual take for both Bald Eagles and Golden Eagles is considerably less than 5% of the 'local-area' population (Table A-12).

## Project Area Moved to Reduce Eagle Mortality

Throughout wildlife surveys during the planning stages of the Willow Creek Wind Energy Facility, Wind Quarry, LLC has been supportive and responsive to ongoing data gathering, analysis, and interpretation. Following suggestions of the American Bird Conservancy, we initiated modeling of the biotic landscape associated with the proposed wind power development to provide "[Encouraging] independent, scientifically-valid pre-construction risk assessment and planning to ensure that wind turbines stay out of sensitive areas for birds [.]" (American Bird Conservancy 2015, http://abcbirds.org/program/wind-energy/bird-smart-strategies/ accessed 20 Sep 2015). In conjunction with wind data recorded on site, the model below was employed by Wind Quarry, LLC and DNV-GL to move the Project Area to its present position north of US Highway 212. This relocation of the Project Area avoids Bald Eagle and Golden Eagle nests along the Belle Fourche River, avoids areas of highest observed eagle density, avoids concentrations of raptor prey such as black-tailed prairie dog colonies, and places nearly 1/3 (approximately, 14) of the planned wind turbines in non-native grassland habitats (intermediate wheatgrass and alfalfa) that are actively hayed.

In order to proactively guide initial placement of turbines, as well as the Project Area as a whole, we modeled eagle occurrence by incorporating four inputs into a spatially explicit model, namely 1) Documented eagle (both Bald Eagle and Golden Eagle) nests near the Project Area, 2) Bald Eagle and Golden Eagle distribution and abundance gathered from incidental wildlife observations, 3) Bald Eagle and Golden Eagle abundance estimates gathered from 153 60-min raptor point counts, and 4) black-tailed prairie dog colonies (Figure 22). We buffered each eagle nest by 6440 m (4 miles), which captures all but one of the 20 inter-nest distances calculated. Average distance between eagle nests (this may have included alternate nests that were not used in 2013 and/or 2014) equaled 2603.9 $\pm$ 455.9 m (20 comparisons; Figure 10).

An eagle suitability model was produced to assist in the placement of the wind turbine array with the following model:

Suitability to eagles = black-tailed prairie dog colony + 6440 m (4 miles) within eagle nests + IDW (inverse distance weighted smoothing on 12 nearest neighbors) of eagle abundances generated from 153 sixty-minute raptor point counts + IDW smoothing on all eagle observations gathered from 2011-2014.

An inverse of this model produced areas most suitable to placement of wind turbines with respect to avoiding areas used by Bald Eagles and Golden Eagles (Figure 23) which was then employed to move the Project Area north of US Highway 212.

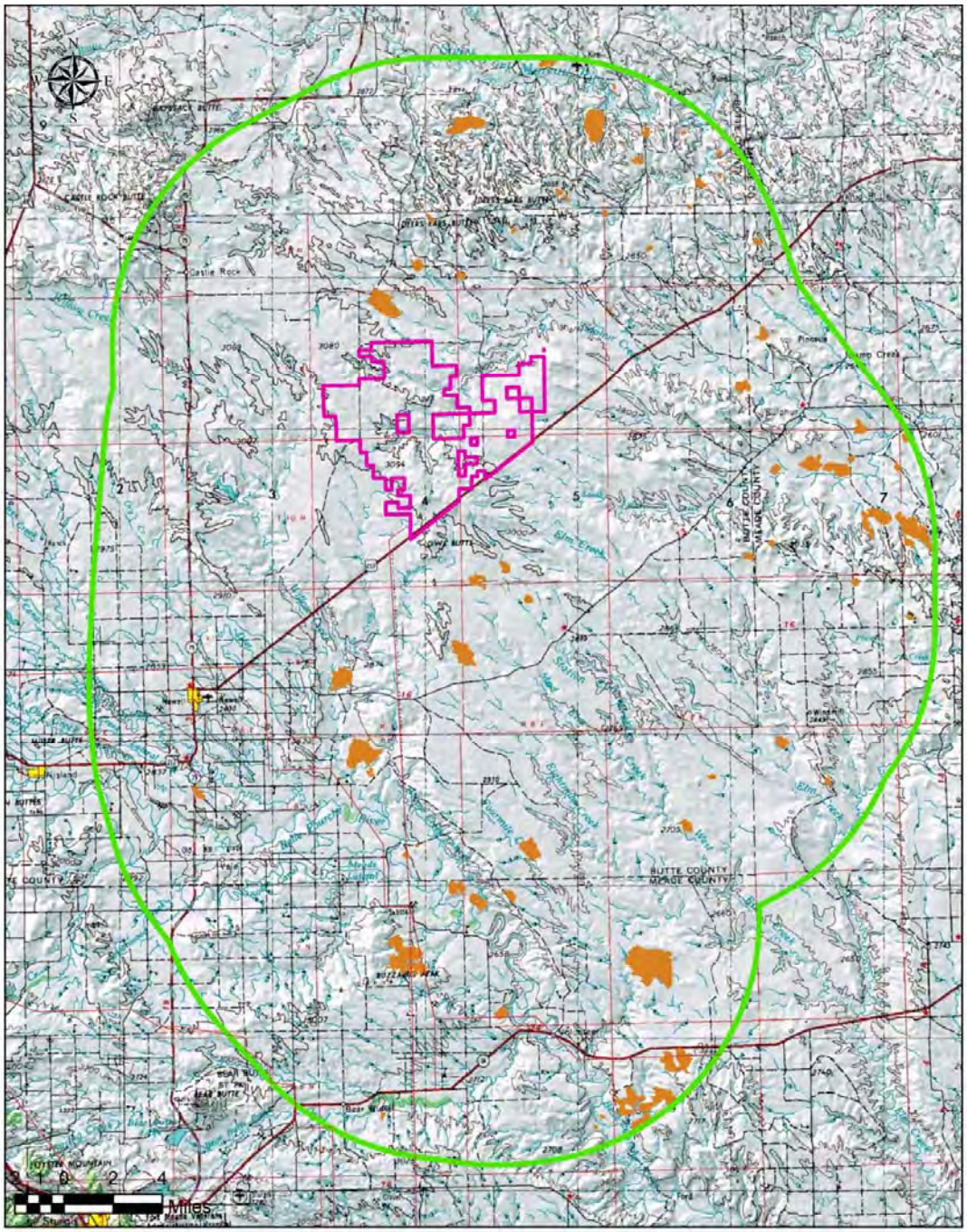
## Table A-11. Estimates of Annual and 30-year Fatality Rates for All Eagles, Bald Eagles, and Golden Eagles for the Willow Creek Wind Power Project

| | All Eagles | | | | Bald Eagles | | | | Golden Eagles | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Low Estimate | Mean Estimate | 95% Estimate | High Estimate | Low Estimate | Mean Estimate | 95% Estimate | High Estimate | Low Estimate | Mean Estimate | 95% Estimate | High Estimate |
| Eagle Use (total observed/total count hours) | 0.6164 | 0.6164 | 0.6164 | 0.6164 | 0.1301 | 0.1301 | 0.1301 | 0.1301 | 0.4863 | 0.4863 | 0.4863 | 0.4863 |
| Survey Plot Radius (m) | 5660 | 1565 | 4000 | 800 | 5660 | 1565 | 4000 | 800 | 5660 | 1565 | 4000 | 800 |
| Mean Flight Time < 200 m | 5.3846 | 5.3846 | 5.3846 | 5.3846 | 4.4375 | 4.4375 | 4.4375 | 4.4375 | 5.6290 | 5.6290 | 5.6290 | 5.6290 |
| Flight minutes/observation hour | 3.3193 | 3.3193 | 3.3193 | 3.3193 | 0.5775 | 0.5775 | 0.5775 | 0.5775 | 2.7374 | 2.7374 | 2.7374 | 2.7374 |
| Exposure Rate | 0.0005 | 0.0072 | 0.0011 | 0.0275 | 0.0001 | 0.0013 | 0.0002 | 0.0048 | 0.0005 | 0.0059 | 0.0009 | 0.0227 |
| Total Daylight Minutes | 267741 | 267741 | 267741 | 267741 | 267741 | 267741 | 267741 | 267741 | 267741 | 267741 | 267741 | 267741 |
| Number turbines (Siemens 2.3-108) | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| Total Turbine Hazardous Area (D) ha | 141.3717 | 141.3717 | 141.3717 | 141.3717 | 141.3717 | 141.3717 | 141.3717 | 141.3717 | 141.3717 | 141.3717 | 141.3717 | 141.3717 |
| Exposure Minutes within Hazardous Area per year | 208.0589 | 2721.3886 | 416.5808 | 10414.5203 | 36.1978 | 473.4636 | 72.4762 | 1811.9044 | 171.5853 | 2244.3170 | 343.5523 | 8588.8084 |
| Exposure Hours within Hazardous Area per year | 3.4676 | 45.3565 | 6.9430 | 173.5753 | 0.6033 | 7.8911 | 1.2079 | 30.1984 | 2.8598 | 37.4053 | 5.7259 | 143.1468 |
| Probabilty of collision (C) if eagle enter hazardous area (Tucker 1996) | 0.0220 | 0.0220 | 0.0220 | 0.0220 | 0.0220 | 0.0220 | 0.0220 | 0.0220 | 0.0220 | 0.0220 | 0.0220 | 0.0220 |
| Project Footprint Area (ha) | 16327 | 16327 | 16327 | 16327 | 16327 | 16327 | 16327 | 16327 | 16327 | 16327 | 16327 | 16327 |
| Proportion (%) of Project Area as Hazardous | 0.0087 | 0.0087 | 0.0087 | 0.0087 | 0.0087 | 0.0087 | 0.0087 | 0.0087 | 0.0087 | 0.0087 | 0.0087 | 0.0087 |
| Fatalities/year= exposureminutes below 200m *(D/total project area)*C | 0.0397 | 0.5188 | 0.0794 | 1.9856 | 0.0069 | 0.0903 | 0.0138 | 0.3455 | 0.0327 | 0.4279 | 0.0655 | 1.6375 |
| Fatalities/year= exposureminutes below 200m *(D/total project area)*C with 95% avoidance | 0.0020 | 0.0259 | 0.0040 | 0.0993 | 0.0003 | 0.0045 | 0.0007 | 0.0173 | 0.0016 | 0.0214 | 0.0033 | 0.0819 |
| Estimated eagle fatalities over 30 year project life with behavioral avoidance | 0.0595 | **0.7783** | **0.1191** | 2.9784 | 0.0104 | **0.1354** | **0.0207** | 0.5182 | 0.0491 | **0.6418** | **0.0983** | 2.4563 |

## Table A-12. Estimates of Annual Fatality as Proportion of Local Area Populations for Bald Eagles and Golden Eagles in the Willow Creek Wind Power Project

| | | | | | | | Management Unit | | "Local Area" | Project |
|---|---|---|---|---|---|---|---|---|---|---|
| | Management | Buffer Distance | Buffer | Project | Total | Management Unit | Mean Density | "Local-area" | 5% Benchmark | Area |
| Species | Unit | Distance | Area ($mi^2$) | Area ($mi^2$) | Area ($mi^2$) | Population | (eagles/$mi^2$) | Population | Fatality | Estimate |
| Bald Eagle | Region 6 | BAEA 53 MILE BUFFER | 10305.09 | 36.72 | 10341.81 | 5385 | 0.0074 | 76.53 | 3.83 | 0.0045 |
| Golden Eagle | BCR17 | GOEA 150 MILE BUFFER | 74753.86 | 36.72 | 74790.58 | 7800 | 0.0549 | 4106.00 | 205.30 | 0.0214 |

**Figure 22. Black-tailed Prairie Dog Colonies**
**[SD Natural Heritage Database and This Study; Scale (1:341,038)]**




**Legend**

PROJECT_JULY2015UTM
BearButte Transmission Lines
10MILEBUFFER_FALL2013UPDATED
PRAIRIE_DOG_COLONY_POLYGONS_MERGED2015

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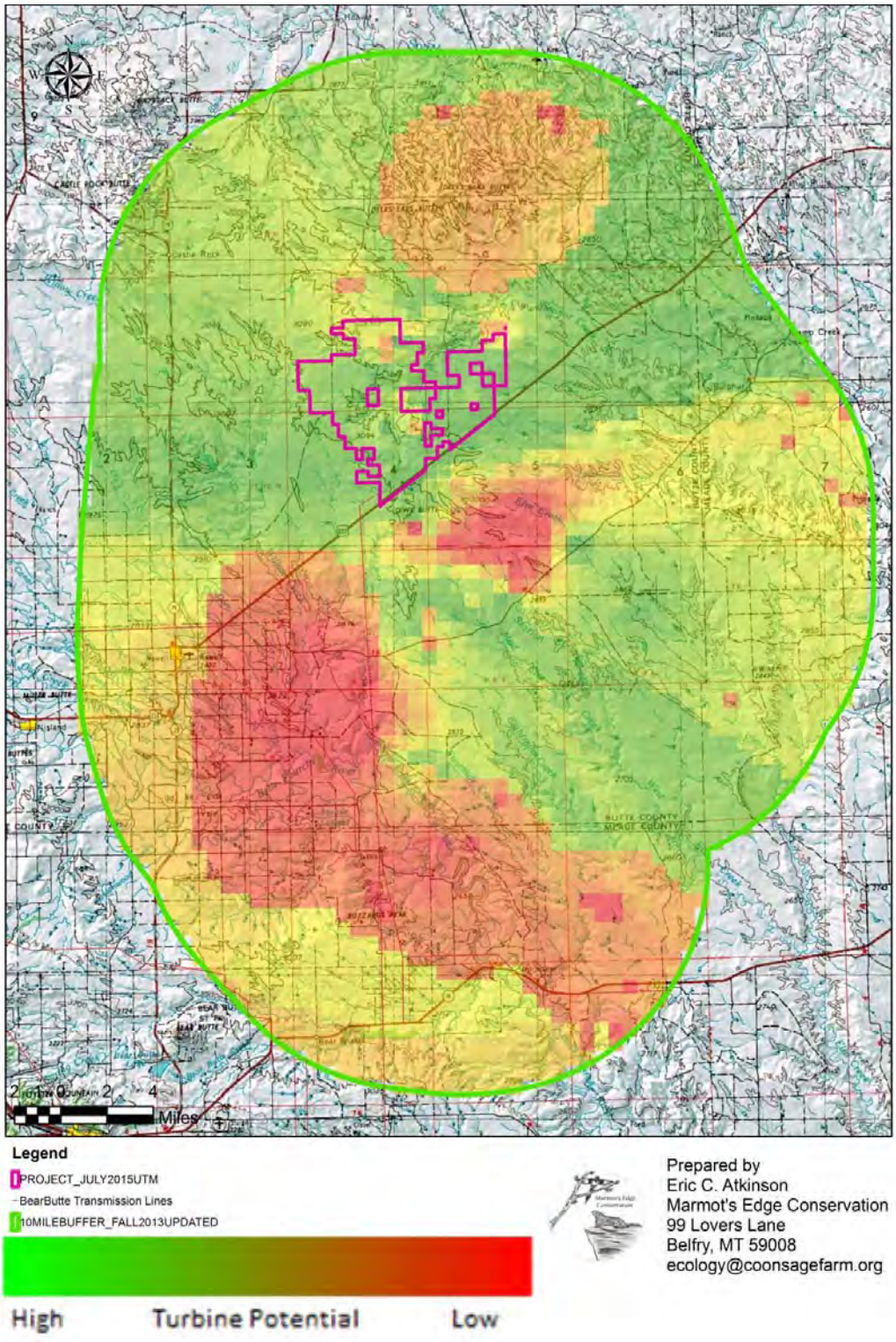
**Figure 23. Priority Areas for Wind Turbine Placement Based Upon Areas of Lowest Bald Eagle and Golden Eagle suitability [Scale (1:341,038)]**



# *Willow Creek Wind Project*
# *Part B: Bird and Bat Conservation Strategy*

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27 September 2015

# INTRODUCTION

Wind Quarry, LLC as part of their due diligence process, has developed this Bird and Bat Conservation Strategy (BBCS) to avoid and reduce potential impacts to birds and bats at the Willow Creek Wind Power Project. This BBCS is set upon the foundation of wildlife surveys outlined in Part A of this report providing documentation of scientific analyses of the Project's potential impacts to bird and bat species and their habitats, and the systematic processes which will be used for evaluating these impacts. The Project is using the tiered approach described in the U.S. Fish and Wildlife Services' (USFWS) Land Based Wind Energy Guidelines (WEG; USFWS 2012) as well as the Western Area Power Administration's (WAPA) Upper Great Plains Wind Energy Programmatic Environmental Impact Statement (DOE/EIS-408). The project and species Consistency Evaluation Forms (CEFs) will be used for documenting and verifying that project proponents have complied with the requirements of the Programmatic BA (i.e., that the project will not have adverse effects on listed, candidate, or proposed species) and are consistent with Tiers I, II, III of the U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines (USFWS 2012).

This BBCS will be in effect throughout the life of the Project as a working document. The main goals of the Willow Creek Wind Power Project BBCS are to:

- Minimize bird and bat fatalities and secondary effects on wildlife at the Project;
- Comply with federal and state wildlife regulations (e.g., Migratory Bird Treaty Act);
- Effectively document any bird or bat injuries and fatalities to provide a basis for ongoing development of avian and bat protection procedures;
- Outline ongoing surveys, monitoring, and management efforts to avoid and minimize adverse wildlife impacts throughout the Project;
- Implement adequate training for all personnel and subcontractors; and
- Plan for effective and continuous coordination between Wind Quarry, the USFWS and the South Dakota Game Fish and Parks (SDGFP).

The following is a summary of correspondence and meetings held with, and material submitted by Wind Quarry LLC to the USFWS, South Dakota Public Utilities Commission (PUC), SDGFP, and Bureau of Land Management (BLM) regarding the proposed Project:

- October 2010: Conference call with USFWS regarding siting of the project in the Newell area on 9400 ac. of BLM managed Public Lands.
- July 2011: Met with BLM SD Field Office to discuss wildlife concerns on public lands.
- 1 Aug. 2011: Data request to SD Natural Heritage Database for tracked species occurrences in or near the proposed Project Area.
- 10 Jan. 2013: Conference call with USFWS and SDGFP to discuss wildlife inventory methods and potential project impacts to various wildlife species.
- 19 Jan. 2013: Meeting with BLM South Dakota Field Office to discuss wildlife issues.
- 13 March 2014: Conference call with USFWS, WAPA, and SDGFP to discuss potential impacts to wildlife species.
- 8 July 2015: Public Information Meeting in Newell, SD.
- 9 July 2015: Site visit with USFWS, SDGFP, and WAPA to review potential layout of turbines, discuss wildlife issues, and appraise areas of sensitivity.
- 9 July 2015: SD PUC Public Meeting in Newell, SD.

# REGULATORY FRAMEWORK

## Fish and Wildlife Laws, Regulations, and Policies

### Migratory Bird Treaty Act (MBTA)

The Migratory Bird Treaty Act (MBTA; 16 U.S.C. §§ 703-712) prohibits the taking, killing, injuring or capture of listed migratory birds. Neither the MBTA nor its implementing regulations (50b Code of Regulations –CFR-Part 21) provide for the permitting of "incidental take" of migratory birds that may be killed or injured by wind turbines. To avoid and reduce potential impacts to species protected under the MBTA at the Project, Wind Quarry will implement this BBCS throughout the life of the Project. This BBCS incorporates results from pre-construction avian habitat and use surveys within and adjacent to the Project Area, patterns of bird mortality reported at other wind energy facilities, and recommendations obtained through consultation with USFWS and SDGFP for reducing impacts to birds. Avoidance and minimization measures for reducing MBTA-listed species at the Project were developed based on these data and are described in this BBCS.

### Bald and Golden Eagle Protection Act (BGEPA)

The Bald and Gold Eagle Protection Act of 1940 (BGEPA; 16 USC 668-668d and 50 CFR 22.26), and its implementing regulations, provides additional protection to Bald Eagles and Golden Eagles such that it is unlawful to take an eagle. In this statute, the definition of "take" is to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest, or disturb." The term "disturb" is defined at 50 CFR 22.3 to include "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best available scientific information available:

(1) injury to an eagle,

(2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or

(3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In 2013, the USFWS released of the Eagle Conservation Plan Guidance: Module 1 – Land-based Wind Energy, Version 2 (USFWS 2013). This guiding document provides a means of compliance with the BGEPA by providing recommendations and in-depth guidance for:

- Conducting early pre-construction assessments to identify important eagle use areas;
- Avoiding, minimizing, and/or compensating for potential adverse effects to eagles; and
- Monitoring for any impacts to eagles during construction and operation.

The Guidance interprets and clarifies the permit requirements in the regulations at 50 CFR 22.26 and 22.27, and does not impose any binding requirements beyond those specified in the regulations. As for other MBTA-listed species, this BBCS incorporates site-specific, regional, and agency information and measures developed based on this information to avoid and reduce impacts to Bald Eagles and Golden Eagles at the Willow Creek Wind Power Project.

### Endangered Species Act (ESA)

The federal Endangered Species Act (ESA) of 1973 (16 U.S.C. §§1531 et seq.) provides for the listing, conservation, and recovery of endangered species. Section 9 of the ESA prohibits the take of any endangered or threatened species of fish or wildlife listed under the ESA. Under the ESA, the term "take" is defined to mean "…to harass, pursue, hunt, shoot, wound, kill, trap, capture, or collect species listed as endangered or threatened, or to attempt to engage in any such conduct. The siting, design, and operation components of the Willow Creek Wind Power Project incorporate measures to ensure the potential for impacts to ESA-listed species is reduced; these measures are described in this BBCS.

At the federal level, 51 species of plants and animals are federally listed and either Threatened or Endangered, nine of which are terrestrial vertebrates (Table B-1). By South Dakota statute, 13 species are listed as State Threatened or State Endangered. Overall, potential habitat within the Project Area exists for two federally designated species whereas nonbreeding habitat and breeding habitat are present for two state designated species. Of the four either federal or state listed species presence within the project Area has been documented for two species; nonbreeding occurrence for both Peregrine Falcons and Sprague's Pipits.

## Other Federal, State, County, Local and Tribal Laws, Regulations, and Policies

### South Dakota Chapter 34A-8. Endangered and Threatened Species

Terms as used in this South Dakota Chapter 34A-8 §34A-8-1, are defined in the following manner:

(1) "Endangered species": any species of wildlife or plants which is in danger of extinction throughout all or a significant part of its range other than a species of insects determined by the Game, Fish and Parks Commission or the secretary of the United States Department of Interior to constitute a pest whose protection under this chapter would present an overwhelming and overriding risk to man;

(2) "Nongame species": any wildlife species not legally classified a game species, fur-bearer, threatened species, or as endangered by statute or regulations of this state;

(3) "Threatened species": any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range;

(4) "Wildlife": any non-domesticated animal, whether reared in captivity or not, including any part, product, egg, or offspring thereof, or the dead body or parts thereof.

### South Dakota Chapter 34A-8A. Species of Management Concern

Definitions of terms in §§ 34A-8A-2 to 34A-8A-7 include:

(1) "Departments": the Department of Game, Fish, and Parks and the Department of Agriculture;

(2) "Species of management concern": a species designated by the secretary of the Department of Agriculture and the Game, Fish and Parks Commission as a species which shares the dual status of requiring both control and protection.

**Table B-1. TES Species Occurring in South Dakota**

| Common Name | Scientific Name | Federal Status | State Status | Habitat Project Area | Documented Project Area |
|---|---|---|---|---|---|
| **Invertebrates** | | | | | |
| American burying beetle | *Nicrophorus americanus* | LE | | NO | NO |
| Scaleshell | *Leptodea leptodon* | LE | | NO | NO |
| Higgins Eye | *Lampsilis higginsii* | LE | | NO | NO |
| Dakota skipper | *Hesperia dacotae* | LT | | NO | NO |
| Poweshiek skipperling | *Oarisma poweshiek* | LE | | NO | NO |
| **Fishes** | | | | | |
| Banded killifish | *Fundulus diaphanus* | | SE | NO | NO |
| Blacknose shiner | *Notropis heterolepis* | | SE | NO | NO |
| Finescale dace | *Chrosomus neogaeus* | | SE | NO | NO |
| Longnose sucker | *Catostomus catostomus* | | ST | NO | NO |
| Northern pearl dace | *Margariscus nachtriebi* | | ST | NO | NO |
| Northern redbelly dace | *Chrosomus eos* | | ST | NO | NO |
| Pallid sturgeon | *Scaphirhynchus albus* | LE | SE | NO | NO |
| Shovelnose sturgeon | *Scaphirhynchus platorynchu*s | LT | | NO | NO |
| Sicklefin chub | *Macrhybopsis meeki* | | SE | NO | NO |
| Sturgeon chub | *Macrhybopsis gelida* | | ST | NO | NO |
| Topeka shiner | *Notropis topeka* | LE | | NO | NO |
| **Reptiles and Amphibians** | | | | | |
| Eastern hognose snake | *Heterodon platirhinos* | | ST | NO | NO |
| False map turtle | *Graptemys pseudogeographica* | | ST | NO | NO |
| Lined snake | *Tropidoclonion lineatum* | | SE | NO | NO |
| **Birds** | | | | | |
| American dipper | *Cinclus mexicanus* | | ST | NO | NO |
| Bald eagle | *Haliaeetus leucocephalus* | | | NO | NO |
| Eskimo curlew | *Numenius borealis* | LE | SE | NO | NO |
| Interior least tern | *Sterna antillarum athalassos* | LE | SE | NO | NO |
| Osprey | *Pandion haliaetus* | | ST | NO | NO |

| Common Name | Scientific Name | Federal Status | State Status | Habitat Project Area | Documented Project Area |
|---|---|---|---|---|---|
| Peregrine falcon | *Falco peregrinus* | | SE | Nonbreeding | YES |
| Piping plover | *Charadrius melodus* | LT | ST | NO | NO |
| Whooping crane | *Grus americana* | LE | SE | Potential | NO |
| Sprague's pipit | *Anthus spragueii* | C | | Nonbreeding | YES |
| Rufa Red Knot | *Calidris canutus rufa* | LT | | NO | NO |
| **Mammals** | | | | | |
| Black-footed ferret | *Mustela nigripes* | LE | SE | NO | NO |
| Gray wolf | *Canis lupus* | LE | | NO | NO |
| Northern long-eared bat | *Myotis septentrionalis* | LT | | NO | NO |
| Northern river otter | *Lontra canadensis* | | ST | NO | NO |
| Swift fox | *Vulpes velox* | | ST | YES | NO |
| **Plants** | | | | | |
| Western prairie fringed orchid | *Platanthera praeclara* | LT | | NO | NO |
| Leedy's Roseroot | *Rhodiola integrifolia ssp. leedyi* | LT | | NO | NO |

Source: http://gfp.sd.gov/wildlife/threatened-endangered/threatened-species.aspx#sthash.liiRLmbs.dpuf

LE = Federal Endangered; SE = State Endangered; LT = Federal Threatened; ST = State Threatened; C = Federal Candidate; PE = Proposed Endangered; PT = Proposed Threatened

# PROJECT DESCRIPTION

## Project Area, Siting, and Facilities Siting

Wind Quarry Operations, LLC (the Applicant), is proposing to construct the Willow Creek Wind Energy Facility (Project), a 103-megawatt (MW) nameplate capacity wind energy facility located on approximately 40,000 acres of privately owned land in Butte County, South Dakota (Project Area), approximately 10 miles northeast of Newell, South Dakota. The proposed Project includes approximately 45 wind turbines, associated access roads, a new collector substation, an operations and maintenance (O&M) facility, and associated transmission interconnection facilities. The Project would interconnect to the U.S. Department of Energy (DOE) Western Area Power Administration (Western) Maurine to Rapid City 115-kilovolt (kV) transmission line, which extends through the Project Area. The Project would generate utility scale electric power for residential, commercial, and industrial consumers. Power from the Project would help meet the growing generation needs of the region for several decades and provide a significant economic benefit to the local community and government.

## Project Components

### Wind Turbines

The proposed Project would consist of approximately 45 three-bladed, horizontal-axis 2.3-MW wind turbines. The turbines would have a rotor diameter of approximately 108 meters and a rotor speed of 6 to 16 revolutions per minute (rpm). The cut-in speed is 4.0 meters per second (8.9 miles per hour [mph]) and the cut-out speed is 25 meters per second (55 mph). The turbines would have hydraulic braking systems, lightning protection, and active yaw and pitch control. The towers would be constructed of tubular steel with a hub height of approximately 80 meters (262.5 feet). The towers would be manufactured in sections that are transported to the site on specially designed tractor-trailers. The foundations would be specifically designed for each turbine, based upon geotechnical analysis of core samples at each turbine location. Towers would be erected onsite with the base mounted to the foundation using high strength steel bolts. An entry door near the base would provide access to the turbine from the tower interior for service personnel and equipment.

### Access Roads and Crane Paths

Primary access to the Project Area would be from U.S. Highway 212, with secondary access from Twilight Road and Double R Road to the north and from Old Highway 212 to the south. New access roads would be constructed within the Project Area to facilitate both construction and maintenance of the wind turbines and associated facilities. New access roads would be constructed to facilitate both construction and maintenance of the wind turbines. This road network would include approximately 26 miles of new or upgraded roads. These roads would be designed to minimize length and construction impact. Initially, turbine access roads would be approximately 20 meters (66 feet) in width to accommodate the safe operation of construction equipment. For purposes of calculating temporary impacts in this application, the Applicant has assumed approximately 207 acres of total temporary disturbance from access road construction. Upon completion of construction, the turbine access roads would be reclaimed and narrowed to an extent allowing for the routine maintenance of the facility. Based

on an estimated average road width of 10 meters (33 feet), the Applicant has assumed approximately 103 acres of total permanent disturbance from access roads. Select existing State, county, and section line roads may also be improved upon to aid in servicing the turbine sites.

The wind turbines would be accessible from public roads via all-weather Class 5 gravel roads. Access roads would follow fence lines, field lines, and existing field access roads to the extent possible. Siting roads in areas with unstable soil would be avoided wherever possible. Roads would include appropriate drainage controls, including culverts, and would be constructed in a manner to allow farm and/or land owner equipment to cross. The roads would be surfaced with road base designed to allow passage under inclement weather conditions. The access road cross sections would consist of graded soil, overlain by geotextile fabric (if needed), and surfaced with compacted aggregate base course.

### Underground Electrical Collection System

A step-up transformer at the base of each turbine would convert the 660-volt (V) turbine output to 34.5-kV. The power from each turbine would flow through a 34.5-kV underground collector system to a central collector substation (Willow Creek Substation), located in the Project Area. The underground collector system would consist of underground cables, buried to a depth of approximately 6 feet. The total estimated length of the proposed collector system is 26 miles.

### Collector and Interconnection Substations

The proposed location for the Willow Creek Substation is approximately 0.5 mile northeast of Double R Road on the north side of U.S. Highway 212. At Willow Creek Substation, the power from the collector system would be transformed from 34.5 kV to 115 kV. Power would be delivered from Willow Creek Substation to a new Western-owned substation, interconnected to the existing Western-owned Maurine to Newell 115-kV section of the Maurine to Rapid City 115-kV transmission line. It is anticipated that the new Western substation would be located adjacent to Willow Creek Substation, and the proposed transmission interconnection would consist of three jumpers, approximately 100 feet in length, between the two substations. One steel dead-end structure, approximately 35 feet in height, would be installed at each substation to connect the jumpers.

### Generation-Tie Line

Since the point of interconnection is on the project site, no new generation tie line will be required.

### Fiber Optic Communication Lines

The fiber optic communication lines for the Project would be installed in the same trenches as the underground collector cables and connect each turbine to the O&M facility and Willow Creek Substation.

### Meteorological Towers (MET towers)

The Applicant has deployed four temporary 60-meter meteorological towers and two SODAR units within the Project Area. These temporary meteorological towers are expected to be removed within 1 year of Project construction. The Applicant anticipates that the Project would include wind measurement equipment, which could consist of a Light Detection and Ranging (LIDAR) or SODAR unit, or one or two permanent 60-meter (197 feet) or 80-meter (262 feet) meteorological towers to house anemometers to measure the wind speed. The permanent towers would not have guy wires and would be lighted as necessary to comply with FAA guidelines. Each meteorological tower would result in a permanent impact of approximately 6.2 meters by 6.2 meters (20.5 feet by 20.5 feet), or 39 square meters (420 square feet).

A LIDAR or SODAR unit is typically located near (within 300 feet) one of the permanent meteorological towers in a small trailer approximately 3 meters (10 feet) high with an attached 6-meter (20 feet) wind sensor boom. The purpose of the unit is to remotely measure the vertical turbulence structure and wind profile up to 200 meters (656 feet) in 9.8-meter (32-foot) increments.

## Operations and Maintenance Building

The proposed location for the O&M facility is in Section 14, Township 11 North, Range 7 East. There is an approximately 3,500-square foot, unfinished, single-family home on the property that would be finished to serve as the office. An approximately 5,000-square foot utility building would be erected for storage and maintenance work.

## Other Associated Facilities

During construction, it is likely that a temporary stockpile or laydown area would be selected within the Project Area. Turbine components may be temporarily stored in an area covering approximately 15 to 20 acres before being moved to the final turbine sites. In addition, one or more concrete batch plants may be necessary during construction in order to prepare concrete for foundations onsite. It has not been determined at this time if onsite batch plants will be necessary for the Project. If they are utilized, each would temporarily impact approximately 3 acres of land, and it is anticipated that they would be located within the temporary laydown area. For purposes of calculating temporary impacts in this application, the Applicant has assumed that one approximately 40-acre laydown/stockpile/batch plant area would be used during construction. In addition to the approximately 40-acre laydown/stockpile/batch plant area, temporary crane walk disturbances would also be necessary for the Project. Crane walks are estimated to be 40 feet wide and would be located along the approximately 26 miles of access roads. For purposes of calculating temporary impacts in this application, the Applicant has assumed that the temporary disturbance from the crane walks would be within the 20-meter-wide temporary construction disturbance width for the access roads.

# BEST MANAGEMENT PRACTICES

WAPA (2015) lists Best Management Practices to reduce the effects of wind power development upon federally listed wildlife resources (Section 5.6.2 and Table ES 5-2, therein). Following suggestions in USFWS (2012, 2013), Wind Quarry, LLC has employed suggested practices including planning and preconstruction surveys of both the Project Area, and 10-mile buffers. Moreover, the Project Area has been moved to avoid areas of high eagle density and prey availability. Wind Quarry, LLC will continue to employ BMPs to minimize impacts upon Whooping Cranes, Rufa Red Knots, Sprague's Pipits, northern long-eared bats, in addition to Greater Sage-Grouse (for which suitable habitat does not occur in the Project Area). Each species is specifically addressed through the attached Consistency Evaluation Forms [see Consistency Evaluation Forms (CEFs); Appendix B-1] and a Bird and Bat Conservation Strategy (BBCS; this document).

We performed surveys during planning and preconstruction phases for both Whooping Cranes and Rufa Red Knots. Additionally, reconnaissance of suitable habitats throughout the Project Area was performed yielding presence of potential habitat but no occurrences of said species. The Project Area lies outside the 95% Migration Corridor for Whooping Cranes and no Rufa Red Knot observations are contained within USFWS and/or SDNHP records near the Project Area. Rufa Red Knots are rarely observed within interior flyways.

As breeding by Sprague's Pipits has not been observed within the Project Area, and high quality native habitat is generally lacking, Wind Quarry, LLC is applying general Best Management Practices to reduce fragmentation of grassland habitats. By siting as many turbines in non-native grasslands as possible and installing bird flight deflectors on any guy wires necessary for supporting temporary meteorological towers, Wind Quarry, LLC is working to minimize negative impacts as they may pertain to Sprague's Pipits.

Furthermore, Wind Quarry, LLC is committed to conservation of native grasslands and the fauna inhabiting these vegetation communities. To that end, throughout the preconstruction inventory and evaluation, efforts were made to identify areas of importance to raptors (including both Bald Eagles and Golden Eagles) through 60-minute raptor point counts as well as through general vehicle and pedestrian surveys. Specifically, we documented areas of high prey abundance such as black-tailed prairie dog colonies in addition to areas of highest raptor density. Surveys for nesting raptors were performed from both the air and ground since 2011. Surveys for grassland species, including upland game birds such as Sharp-tailed Grouse and Greater Sage-Grouse were performed through call-surveys, point counts, and general surveys. Surveys were instituted to document the diversity and abundance of breeding grassland birds, especially the Candidate Species Sprague's Pipits, through 10-minute point counts, walking surveys (especially along ridges and areas where vegetation appeared more favorable to this species' presence), and call-back surveys in which the song of a male Sprague's Pipit was broadcast in order to elicit a conspecific response. We instituted acoustical surveys to document bat presence and relative abundance. Finally, general wildlife surveys were performed across all habitats (native western wheatgrass uplands, ephemeral streams in drainages, stock ponds and associated mesic areas, and introduced grasslands that were often hayed) to document presence of insects, amphibians, reptiles, birds, and mammals (see Part A: Wildlife Inventories).

With the aforementioned occurrence, diversity, and density data we produced a 'raptor heat map' in which areas least conducive to wind turbine placement were modeled based upon occurrence and density of Bald Eagles and Golden Eagles, distance to eagle nest, and active black-tailed prairie dog colony. Wind Quarry, LLC adaptively responded to this map by moving their initial project footprint away from areas of high eagle abundance. Moreover, the complete Project Area was moved north of US Highway 212 in response to these data and individual turbine placement was influenced by the modeled surface.

Construction of turbines may displace birds from an area due to the creation of edge habitat, the introduction of vertical structures, and/or disturbances directly associated with turbine operation (e.g., sound or shadows and human presence). Disturbance impacts are often complex, involving shifts in abundance, species composition, and behavioral patterns with impact magnitude varying across species, habitats, and regions. Most research to-date has focused on collision mortality associated with wind energy facilities. However, Pearce-Higgins et al. (2012) suggests birds may be more greatly affected during wind farm construction than during operation. Limited available data indicate that avoidance impacts to birds generally extend approximately 246-2,625 feet (75-800 m) from a turbine, depending on the environment and the bird species affected (Strickland 2004). Studies in the western and Midwestern U.S. consistently show small-scale (<328 feet [100 m]) impacts on birds (Strickland 2004). Based on these studies, some degree of displacement of breeding birds in the vicinity of the Project turbines is anticipated. For species that are displaced, it is unclear if displacement impacts would persist for the life of the Project; certain species may adapt to the presence of turbines (The Ornithological Council 2007). Furthermore, fragmentation of grassland habitats can be detrimental to prairie landbirds both at an immediate temporal scale and a delayed temporal scale (Shaffer and Buhl 2015).

Wind Quarry, LLC is cognizant of potential displacement of grassland birds as well as fragmentation of habitat. Avian surveys (point count surveys, walking surveys, and call-back surveys) detected no Sprague's Pipits on the Project Area during the breeding season. However, small groups and individuals were observed moving through the Project Area during fall migration. At the individual turbine scale, in addition to wind speed data, sensitivity has been applied to site as many turbines as possible in areas dominated by introduced grasses and/or forbs such as intermediate wheatgrass, quackgrass [*Elymus* (*Agropyron*) *repens*], smooth brome, orchard grass, alfalfa, and yellow sweetclover. These areas are generally in the western and northwestern portion of the Project Area and cover approximately 2350 ha (5800 acres) of the 9500 ha (23,500 acres) Project Area. At this writing, approximately 14 of the planned 45 turbines are planned for these non-natively dominated stands. With regard to the remaining turbines planned to be located in native grassland habitats, efforts will be made to orient turbines in an arrangement to maximize undisturbed native grassland habitats, preferring orientations that leave native grasslands of contiguous area greater than 360 acres (145 ha) and minimizing patches less than 71 acres (29 ha) (Jones 2010)..

In response to USFWS concerns during the site visit of 9 July 2015, two proposed turbine locations have been modified increasing their distance to nearest permanent and/or ephemeral wetlands. The majority of these communities in the Project Area are codominated by native foxtail barley (*Hordeum jubatum*), stinkgrass (*Distichlis spicata*) and introduced curly dock (*Rumex crispus*) providing habitat of marginal quality for most avian species. Overall, 121 wetlands have been identified within the Project Area (National Wetlands Inventory (http://www.fws.gov/wetlands/Data/Mapper.html accessed 27 September 2015) comprising

approximately 348 acres (141 ha). Average wetland size in the project area equals 2.9 acres (1.2 ha), SD = 4.8 acres (1.9 ha), range 0.003-30.01 acres (0.001-12.14 ha).

## Summary of Best Management Practices

Based upon extensive pre-construction surveys, dialogue with WAPA, USFWS, and SDGFP, Wind Quarry, LLC has designed the Willow Creek Wind Project to minimize impacts to wildlife and native vegetation while providing efficient and maximum power output. As addressed above, the overall Project Area has been moved to avoid high raptor use and concentrated prey resources. Additionally, the Project design, construction, and operation will implement industry best management practices based upon USFW wind energy guidelines (USFWS 2012). A summary of these conservation and mitigation practices is provided below.

### General

- Wind Quarry, LLC through Willow Creek Wind Project will comply with all federal, state, and local environmental laws, orders and regulations.
- Wind Quarry, LLC through Willow Creek Wind Project has followed the recommendations provided in the USFWS's Land-Based Wind Energy Guideline (USFWS 2012) and, as appropriate, the Eagle Conservation Plan Guidance (USFWS 2013).
- Wind Quarry, LLC via Willow Creek Wind Project has developed a Bird and Bat Conservation Strategy (BBCS; herein).
- Prior to construction, all supervisory construction personnel will be educated regarding protection of wildlife and other natural resources including:
    - federal and state laws regarding plants, wildlife, and archaeological specimens, including collection and removal,
    - importance of these resources, and
    - identification of these resources.
- Site personnel will be trained in protocol required as part of the wildlife incident reporting system.
- Binoculars will be provided in all project vehicles for the use of personnel.

### Surface Waters, Soils, and Vegetation

- Project- and site-specific appropriate storm water management practices will be implemented. Here, it is important to safeguard soil integrity due to the high erosion potential associated with these soils. Furthermore, water management practices will be employed that do not create attractants for birds. Wind Quarry, LLC and its contractors will implement protective measures to prevent pollution of surface waters.
- Wind Quarry, LLC and its contractors will abide by all federal regulations concerning the crossing of waters of the United States as outlined in Title 33 C.F.R. Part 323.
- Wind turbines and other facilities (excepting, roads and communications lines) will be constructed in upland areas avoiding surface waters and floodplains. Wind Quarry LLC. and its contractors will avoid filling, channelizing, or degrading streams, wetlands, and other mesic areas during Project construction. Any wetland impacts from linear features

(i.e., roads, communication lines, etc.) will be minimized and permitted if necessary via U.S. Army Corps of Engineers.
- Roads and portions of roads, as well as crane paths and staging areas used during construction will be restored to the original contour. Areas to be reclaimed will be reseeded in collaboration with the local landowner, NRCS, SDGFP, and other personnel as deemed appropriate.
- Removal and disturbance of grassland areas will be minimized through utilizing previously disturbed areas, minimizing storage areas, and reclaiming all disturbed area not necessary for project operation.
- Equipment servicing and maintenance will be performed in areas at least 100 m from water bodies or ephemeral streams.
- During operation, vehicle travel will be restricted to designated roads with no off-road travel permitted except in emergencies.

## Site Management

- Willow Creek Wind Project will work with local landowners to discuss removing carrion, afterbirth, and carcasses to avoid attracting eagles and other raptors into the Project Area.
- As part of routine maintenance, Operations and Management personnel will remove, if possible, any carrion beneath wind turbines that may be discovered/
- As part of routine maintenance, Operations and Management personnel will alert Wind Quarry, LLC if roosting bats are encountered on or in any project structures. A Project-associated biologist will determine identification and in collaboration with SDGFP and USFWS determine management actions needed, if any.
- Project personnel and construction subcontractors will be advised to travel less than 25 mph to minimize wildlife mortality via vehicle collisions.
- Willow Creek Wind Project will minimize pesticide use (i.e., rodenticides) in and around structures, relying more heavily upon snap traps for rodent control.
- Willow Creek Wind Project will minimize herbicide use relying more greatly upon spot treatments where possible to manage any invasive weeds documented near the facilities.

## Avian Collision Risk

- Wind turbines and permanent meteorological towers will be unguyed tubular towers with slow-rotating upwind rotors. These structures provide little in the way of roost sites for birds and minimally to bats. Marked guy wires are only present on temporary met towers which will be removed after the first year of construction/operation.
- Willow Creek Wind Project will install bird flight diverters on all new overhead lines consisting of three jumpers, approximately 100 feet in length, between two substations. One steel dead-end structure, approximately 35 feet in height, would be installed at each substation to connect the jumpers.
- Following recommendations by Avian Protection Plan Guidelines (APLIC and USFWS 2005) and APLIC (2006), exposed wires at substations and jumper-supporting apparatus will be outfitted to deter perching of raptors while also protecting those birds that do perch.
- Collection and communications lines will be buried, thereby negating any need to reduce avian collision risk for those structures.

- To avoid disorienting or attracting birds or bats, Willow Creek Wind Project will outfit turbines with strobed, minimum-intensity lights as recommended by the USFWS (2012). Guidance and will be requested from Federal Aviation Administration and all lighting will follow appropriate regulations.
- Lights at substations will be hooded ground-directed and on nocturnal sensors.
- Any nighttime construction, especially during spring and fall migration periods, will use lights necessary for safety with recognition that overly bright lights may prove hazardous to migrating birds. Hence, per safety constraints, all lights will be hooded where practical.

## Raptor Nests

- In the unlikely event that a raptor nest is encountered near a proposed turbine site, Willow Creek Wind Project and its subcontractors will defer construction at that location following USFWS recommendations regarding spatial and seasonal buffers (http://www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/Raptors.html accessed 20 December 2015) as follows.

| | | | |
|---|---|---|---|
| 1) | Northern Harrier nest | Buffer = 0.25 miles | Seasonal Buffer: 1 April-15 August |
| 2) | Golden Eagle nest | Buffer = 0.5 miles | Seasonal Buffer: 15 January-31 July |
| 3) | Ferruginous Hawk nest | Buffer = 1.0 miles | Seasonal Buffer: 15 March-31 July |
| 4) | Swainson's Hawk nest | Buffer = 0.25 miles | Seasonal Buffer: 1 April-31 Aug |
| 5) | Short-eared Owl nest | Buffer = 0.25 miles | Seasonal Buffer: 15 March-1 Aug |
| 6) | Burrowing Owl nest | Buffer = 0.25 miles | Seasonal Buffer: 1 April-15 Sept |

## Wildlife

- Construction at an individual turbine site will be deferred if an active Sharp-tailed Grouse lek is observed within 0.25 miles until occupying birds have dispersed for the season.
- Construction at an individual turbine site will be deferred if an active swift fox den is observed within 0.25 miles until young have dispersed.
- Dialogues with land owners in the area will be initiated in the event mitigation efforts are desired for loss of native grasslands. Mitigation activities including, but not limited to, delayed hay cutting, alternating years of hay production, enhanced native plantings, marking of existing fencing to minimize grouse collisions, etc. may be discussed.

# Monitoring

To enable Wind Quarry, LLC to monitor mortality rates of birds and bats at the Willow Creek Wind Project, post-construction avian and bat mortality monitoring will be conducted in accordance with standardized monitoring protocol. Monitoring will also help determine the effectiveness of avoidance and minimization measures at the facility. The monitoring protocol presented below was developed, in part, using the USFWS Land-Based Wind Energy Guidelines (WEG) (USFWS 2012). It attempts to answer the following questions from Tier 4 of the WEG (USFWS 2012):

1. What are the bird and bat fatality rates for the project?
2. What are the fatality rates of species of concern?
3. How do the estimated fatality rates compare to the predicted fatality rates?
4. Do bird and bat fatalities vary within the project site in relation to site characteristics?
5. How do the fatality rates compare to the fatality rates from existing projects in similar landscapes with similar species composition and use?
6. What is the composition of fatalities by species in relation to migrating and/or resident bird and bat species?
7. Do mortality data suggest the need for measures to reduce impacts?

## Monitoring Goals

Goals of post-construction monitoring are to determine overall avian and bat fatality rates due to the Project implementation and describe this mortality through species composition and seasonal timing to evaluate circumstances under which mortality occurs.

## Species to be Monitored

Post-construction monitoring will address all avian and bat mortalities observed within the Project Area. The monitoring will produce species-specific estimates of mortality based upon the number of carcasses observed if possible.

## Study Design

Results of post-construction monitoring efforts can be influenced by several sources of bias during sampling. Hence, to reduce stochastic sources of variability, we will assess a) fatalities that occur on a highly periodic basis (i.e., during migration), b) carcass removal by scavengers, c) searcher efficiency (i.e., observer effect), d) site-specific variability (i.e., vegetation), and e) fatalities or injured biota that may fall beyond or move beyond the search area (Kunz et al. 2007a). Searcher efficiency and carcass removal, specifically, are known to be two sources of field bias, which are highly variable and site- and research-specific; mortality estimators are highly sensitive to these parameters (Huso 2010). It is recommended that all mortality studies conduct searcher efficiency and carcass removal trials that follow accepted methods and address the effects of differing vegetation types (Kunz et al. 2007a, USFWS 2012). Wind Quarry's post-construction mortality monitoring methodology is designed to account for all of these sources of bias and adapt to preliminary results such that effectiveness, efficiency, and accuracy of the

study is maximized following Huso et al. (2014). Evidence of Absence methodologies (Dalthorp et al. 2014) will be employed.

Post-construction mortality monitoring at the Project Area will involve standardized carcass searches in spring (1 March – 31 May to account for migration), summer (1 June 1 – 15 August accounting for breeding season and early migration), fall (16 August – 21November accounting for migration) and winter (22 November - 28 February accounting for wintering abundances of raptors) during the first full year of operation, accompanied by searcher efficiency trials and carcass removal trials. Standardized carcass searches will allow statistical analysis of the search results, calculation of overall fatality estimates, and assessment of correlations between fatality rates and potentially influential variables (e.g., weather, location). Additional carcass searches will be conducted by Wind Quarry, LLC operational staff following major storm events and are intended to document potential mass mortality events.

### Sample Size

Carcass searches will be conducted at 30% of the Project Area turbines; search turbines will be selected using a systematic sampling method stratified across different habitat types within the Project Area to account for differences in fatality rates among habitat types and geographic locations within the Project area (USFWS 2012). This approach will meet the study goal of detecting and analyzing overall bird and bat fatalities at the Project Area by providing sufficient sample size to support reliable data analysis and related interpretations and conclusions. Hence, turbine site will be the sampling unit.

### Search Interval

The search interval will be once weekly at all of the search turbines. The turbine search schedule and order will be randomized so that each turbine's search plot will be sampled at differing periods in the day. A weekly search interval has been deemed adequate (Kunz et al. 2007a), and studies have shown that a weekly search interval provides effective mortality monitoring and adequately estimates impacts from wind energy facilities (Gruver et al. 2009, Young et al. 2009), such that the added effort associated with more frequent intervals is not warranted. If more or less intensive monitoring is deemed necessary following initial data collection (carcass searchers and carcass removal trials) at the site, the search intervals will be modified accordingly.

### Field Methodologies

As hub height is expected to be approximately 80 m with rotor radius of 53 m, we will employ a search radius of 150 m surrounding the tower. Several studies have indicated that the majority of bird and bat carcasses typically fall within 100 feet (30 m) of the turbine, or within 50% of the maximum height of the turbine (Kerns and Kerlinger 2004, Arnett *et al*. 2005, Piorkowski and O'Connell 2010, Stantec Consulting Services, LLC 2014). The 150 m radius plots will be nearly cover five times the area if one was constrained to one-half turbine height, minimizing the number of fatalities or injuries which land or move outside of the search plots, and thereby reducing the number of carcasses that would be undetected, causing underestimation of overall fatality.

### Standardized Carcass Searches

Carcass searches will be conducted by searchers trained in conducting fatality search methods, including proper handling and reporting of carcasses. Searchers will be familiar with and able to accurately identify bird and bat species likely to be found in the Project Area. Any unknown or suspected ESA-listed species discovered during fatality searches will be sent to a qualified expert for positive identification. During searches, searchers will walk at a rate of approximately 2 mph (45 to 60 m per minute) while searching 10 feet (3 m) on either side of each transect. For all carcasses found, data recorded will include:

- Date and time;
- Initial species identification;
- Sex, age, and reproductive condition (when possible);
- GPS location;
- Distance and bearing to turbine;
- Substrate/ground cover conditions;
- Condition (intact, scavenged);
- Any notes on presumed cause of death; and
- Wind speeds and direction and general weather conditions for nights preceding search.
- A digital picture of each detected carcass will be taken and location coordinates will be logged before the carcass is handled and removed. As previously mentioned, all carcasses will be labeled with a unique accession number, bagged, and stored frozen (with a copy of original specimen tag) frozen at the Project Operation Facility.

Appropriate salvage permits will be acquired from USFWS and SDGFP to cover removal and disposition of specimens. A suitable repository for specimens (i.e., a university/college teaching and/or research collection) will be found, and at this writing will likely be either Northwest College, Powell, Wyoming or another amenable site. If an eagle carcass is found, Project personnel will notify USFWS within one day. Any injured individuals of any species will be turned over to a licensed wildlife rehabilitor as quickly as possible.

## Data Analysis and Reporting

### Data Analysis

Analysis of data collected during the post-construction mortality monitoring will include spring, summer, fall, and winter season fatality estimates, as well as an annual fatality estimate for all birds and bats. Species identification will be completed on all carcasses to the most specific taxonomic level possible. Data analysis will be performed to assess patterns in fatalities across turbine locations. Data will also be analyzed to determine the influence of factors such as date and location on bird and bat fatality rates. Poisson or nondistributional methods may show the greatest promise for elucidating meaningful patterns of mortality by species.

## Statistical Methods for Estimating Fatality Rates

We will apply the most contemporary peer-reviewed models available to estimate mortality rates. Literature searches will be performed in early 2016 and various estimators will be compared.

## Reporting

Wind Quarry, LLC will provide an annual mortality monitoring report to USFWS following the completion of the post-construction monitoring. The report will include fatality estimates and data summaries. Fatalities will be expressed both in terms of fatalities/turbine/season and in terms of fatalities/MW/season, as recommended to facilitate comparison with other studies (USFWS 2012). The report will include all data analyses, including overall fatality estimates discussion of monitoring results and implications. Additionally, we will report the discovery of any ESA-listed species or eagles to UWFWS and the discovery of any state-listed species to SDGFP within one business day of their discovery and/or species identification. Wind Quarry, LLC will also fulfill the reporting requirements of all salvage/collection permits necessary throughout the post-construction monitoring effort.

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Appendix A-1

Field Form for Raptor Point Count Surveys, 2013-2014

# Raptor Data…

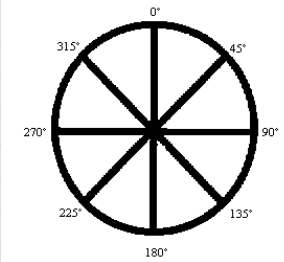
Observer | Day | Month | Year

Point #

Locale notes | Rep

Start-Time | Wind | Wind | Sky | Temp

60 min count | mph | dir | %cc | °F

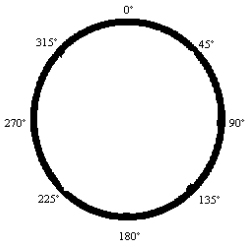



Cover Type (1)
Cover Type (2)
Cover Type (3)
Cover Type (4)

GPS#
E
N

| Habitat Code | Habitat Name |
|---|---|
| | |
| | |
| | |
| | |
| | |

| | Species (4-letter code) | Age | Sex | How # | How VSC | Distance (nearest 10m) | Bearing* (nearest 5°) | Interval (0-10min=1) (10-20min=2) (20-30min=3) (30-60min=4) | Flight Dir | Flight/perch Height (m) | Behavior Perch Flap Kite/Hover Soar | Time 1st Observed | Time last Observed | # min < 200 m ht flight | # min > 200 m ht flight | # min perched | GPS # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | |




| Predominant Trees | | Predominant Shrubs | | Predominant Graminoids | |
|---|---|---|---|---|---|
| Spp w/in 100m | % Cover | Spp w/in 100m | % Cover | Spp w/in 100m | % Cover |
| 1) | | 1) | | 1) | |
| 2) | | 2) | | 2) | |
| 3) | | 3) | | 3) | |

Edaphic features/Notes:

| GPS | Easting | Northing | GPS | Easting | Northing |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Appendix A-2

Field Form for Landbird Point Count Surveys, 2013 & 2014

## Bird Data…

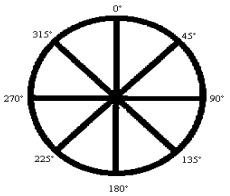
Observer | Year | Month | Day

Transect# | Rep

Drainage

Start Time | Stop # | Wind (mph/dir) | Sky (%cc) | Temp (°F)

GPS PT




ZONE

EASTING

NORTHING

Cover Type (1)
Cover Type (2)
Cover Type (3)
Cover Type (4)

| Habitat Code | Habitat Name |
|---|---|
| | |
| | |
| | |
| | |

| Species (4-letter code) | Sex | Abund. (#) | How VSC | Distance (nearest 10m) | Bearing (nearest 5°) | Interval (0-3min=1) (3-5min=2) (5-10min=3) | Belong to Point (Yes=1) (No=0) | Fly-over (Yes=1) (No=0) | Attracted (Yes=1) (No=0) | Location (1-4=in cover types) (0=out of cover type) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |

**Predominant Graminoids**

| Spp w/in 100m | % Cover |
|---|---|
| 1) | |
| 2) | |
| 3) | |

**Predominant Forbs**

| Spp w/in 100m | % Cover |
|---|---|
| 1) | |
| 2) | |
| 3) | |

**Predominant Shrubs**

| Spp w/in 100m | % Cover |
|---|---|
| 1) | |
| 2) | |
| 3) | |

**Predominant Trees**

| Spp w/in 100m | % Cover |
|---|---|
| 1) | |
| 2) | |
| 3) | |

**Notes:**

HERP SURVEY

START TIME

END TIME

START POINT GPS

END POINT GPS

SURVEY DIST km

SURVEY TIME hours min

NOTES

TOADS SNAKES

FROGS

AMTI

Appendix A-3

Element Occurrence Information Received from the South Dakota Natural Heritage Database, 22 July 2015

**Scientific Name:** ***Apalone spinifera*** **Occurrence #:** 18

**Common Name:** Spiny Softshell **SD Protection Status:**

**Location Information:** **Latitude:** 444249N **Longitude:** 1031841W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | 009N007E | 30 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Vale NE | SD |

**Directions:**

5 miles east of Newell

**Survey Information:**

**First Observation:** 2003 **Survey Date:** **Last Observation:** 2003

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** spiny softshell (1) caught in noop net in Willow Creek

**Scientific Name:** ***Apalone spinifera*** **Occurrence #:** 59

**Common Name:** Spiny Softshell **SD Protection Status:**

**Location Information:** **Latitude:** 444334N **Longitude:** 1033050W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | | | | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Nisland | SD |

**Directions:**

Reservoir coming in to Horse Creek, near the intersection of Orman Rd and StoneLake Rd. Precise location of sighting not provided within the reservour.

**Survey Information:**

**First Observation:** 2013-05-29 **Survey Date:** **Last Observation:** 2013-05-29

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General** Horse Creek

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** 2 adults ovserved basking

**Scientific Name:** ***Aquila chrysaetos*** **Occurrence #:** 114

**Common Name:** Golden Eagle **SD Protection Status:**

**Location Information:** **Latitude:** 443551N **Longitude:** 1031156W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | 007N008E | 06 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Meade | SD | Volunteer | SD |

**Directions:**

BELLE FOURCHE RIVER; ABOUT 2 MILES ESE OF THE POINT WHERE THE RIVER CROSSES THE BUTTE/MEADE COUNTY LINE.

**Survey Information:**

**First Observation:** 2012-03-29 **Survey Date:** **Last Observation:** 1996-03

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:** SITE MAPPED FROM GPS COORDINATES IN REPORT, BUT MAY ACTUALLY BE CLOSER TO THE BELLE FOURCHE RIVER THAN MAPPED.

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** NEST IN COTTONWOOD, INCUBATING ADULT, ANOTHER INACTIVE NEST NEARBY. GOEA observed in nest 1/2 mile SW of 1996 nest during aerial survey.

**Scientific Name:** ***Aquila chrysaetos*** **Occurrence #:** 135

**Common Name:** Golden Eagle **SD Protection Status:**

**Location Information:** **Latitude:** 450006N **Longitude:** 1032718W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|---|
| 10130304 | South Fork Moreau | | 012N005E | 13 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Haystack Butte | SD |

**Directions:**

About one mile south of Castle Rock Butte, or 20 miles NNW of Newell.

**Survey Information:**

**First Observation:** 2005 **Survey Date:** **Last Observation:** 2005-05

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Two nests on cliff, one active. One chick in nest.

**Scientific Name:** ***Aquila chrysaetos*** **Occurrence #:** 156

**Common Name:** Golden Eagle **SD Protection Status:**

**Location Information:** **Latitude:** 450220N **Longitude:** 1031359W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS Note |
|---|---|---|---|---|---|---|
| 10130304 | South Fork Moreau | | | | | |
| | | | 012N007E | 02 | BH | |
| | | | 013N007E | 35 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Deers Ears Butte North | SD |

**Directions:**

24 miles NE of Newell, near the Dakota Range School

**Survey Information:**

**First Observation:** 2005 **Survey Date:** **Last Observation:** 2005-05

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Active nest in cottonwood

**Scientific Name:** ***Ardea herodias*** **Occurrence #:** 40

**Common Name:** Great Blue Heron **SD Protection Status:**

**Location Information:** **Latitude:** 443907N **Longitude:** 1032750W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | 008N005E | 13 | BH | SW4 |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Newell | SD |

**Directions:**

4 SOUTH AND 2 WEST OF NISLAND

**Survey Information:**

**First Observation:** 1990 **Survey Date:** **Last Observation:** 1990-05-19

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General** PROBABLY COTTONWOODS ON A FLOODPLAIN

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** FOURTEEN NESTS AND FOUR ADULT HERONS ON MAY 19, 1990

**Scientific Name:** ***Ardea herodias*** **Occurrence #:** 95

**Common Name:** Great Blue Heron **SD Protection Status:**

**Location Information:** **Latitude:** 450510N **Longitude:** 1031212W

| Watershed Code | Watershed | Township | | | |
|---|---|---|---|---|---|
| | | Range | Section | Meridian | TRS Note |
| 10130304 | South Fork Moreau | | | | |
| | | 013N007E | 13 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Deers Ears Butte North | SD |

**Directions:**

South Fork Moreau River near Hoover

**Survey Information:**

**First Observation:** **Survey Date:** **Last Observation:** 2005-05

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Not active in 2012; 1 nest (2005)

**Scientific Name:** ***Ardea herodias*** **Occurrence #:** 103

**Common Name:** Great Blue Heron **SD Protection Status:**

**Location Information:** **Latitude:** 443302N **Longitude:** 1030937W

| Watershed Code | Watershed | Township | | | |
|---|---|---|---|---|---|
| | | Range | Section | Meridian | TRS_Note |
| 10120202 | Lower Belle Fourche | | | | |
| | | 007N008E | 21 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Meade | SD | Volunteer | SD |

**Directions:**

Belle Fourche River

**Survey Information:**

**First Observation:** **Survey Date:** **Last Observation:** 2005-04-15

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Unknown status in 2012, GBHE present but not determined if breeding; 1 nest (2005)

**Scientific Name:** ***Ardea herodias*** **Occurrence #:** 184

**Common Name:** Great Blue Heron **SD Protection Status:**

**Location Information:** **Latitude:** 450418N **Longitude:** 1030447W

**Watershed Code** **Watershed** **Township**

| | | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10130304 | South Fork Moreau | | | | |
| | | 013N008E | 24 | BH | |
| | | 013N009E | 19 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Tomato Can Buttes | SD |

**Directions:**

S. Fork Moreau River - Twilight Road

**Survey Information:**

**First Observation:** 2012 **Survey Date:** **Last Observation:** 2012

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** 7 nesting pairs observed

**Scientific Name:** ***Athene cunicularia*** **Occurrence #:** 69

**Common Name:** Burrowing Owl **SD Protection Status:**

**Location Information:** **Latitude:** 444048N **Longitude:** 1031746W

**Watershed Code** **Watershed** **Township**

| | | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | 008N007E | 05 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Vale NE | SD |

**Directions:**

About 6 miles SE of Newell.

**Survey Information:**

**First Observation:** 2005-08 **Survey Date:** **Last Observation:** 2005-08

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Eleven burrowing owls on a 139 hectare Cynomys colony.

**Scientific Name:** ***Athene cunicularia*** **Occurrence #:** 70

**Common Name:** Burrowing Owl **SD Protection Status:**

**Location Information:** **Latitude:** 444126N **Longitude:** 1031341W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS Note |
|---|---|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | | |
| | | 008N007E | 02 | BH |

| **County Name** | **State** | **Quadrangle** | **State** |
|---|---|---|---|
| Butte | SD | Volunteer NW | SD |

**Directions:**

About 8 miles ESE of Newell

**Survey Information:**

**First Observation:** 2005-08 **Survey Date:** **Last Observation:** 2005-08

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Five burrowing owls on a 198 hectare Cynomys colony.

**Scientific Name:** ***Athene cunicularia*** **Occurrence #:** 71

**Common Name:** Burrowing Owl **SD Protection Status:**

**Location Information:** **Latitude:** 444137N **Longitude:** 1031804W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | | | | |

| | | |
|---|---|---|
| 009N007E | 32 | BH |

| **County Name** | **State** | **Quadrangle** | **State** |
|---|---|---|---|
| Butte | SD | Vale NE | SD |

**Directions:**

About four miles ESE of Newell

**Survey Information:**

**First Observation:** 2005-08 **Survey Date:** **Last Observation:** 2005-08

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Burrowing owl on 8.8 hectare Cynomys colony.

**Scientific Name:** ***Athene cunicularia*** **Occurrence #:** 73

**Common Name:** Burrowing Owl **SD Protection Status:**

**Location Information:** **Latitude:** 443356N **Longitude:** 1031522W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | 007N007E | 15 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Meade | SD | Vale SE | SD |

**Directions:**

27 km NE of Sturgis

**Survey Information:**

**First Observation:** 2005-08 **Survey Date:** **Last Observation:** 2005-08

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Twelve burrowing owls on a 150 hectare Cynomys colony.

**Scientific Name:** ***Athene cunicularia*** **Occurrence #:** 74

**Common Name:** Burrowing Owl **SD Protection Status:**

**Location Information:** **Latitude:** 443549N **Longitude:** 1031146W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | 007N008E | 06 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Meade | SD | Volunteer | SD |

**Directions:**

33 km NE of Sturgis

**Survey Information:**

| | | | | | |
|---|---|---|---|---|---|
| **First Observation:** | 2005-08 | **Survey Date:** | | **Last Observation:** | 2005-08 |
| **Eo Type:** | | **Eo Rank:** | | **Eo Rank Date:** | |

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Two burrowing owls on a 20 hectare Cynomys colony.

**Scientific Name:** ***Athene cunicularia*** **Occurrence #:** 82

**Common Name:** Burrowing Owl **SD Protection Status:**

**Location Information:** **Latitude:** 444053N **Longitude:** 1031128W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | 008N008E | 06 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Volunteer NW | SD |

**Directions:**

8.5 km ESE of Newell

**Survey Information:**

| | | | | | |
|---|---|---|---|---|---|
| **First Observation:** | 2005-08 | **Survey Date:** | | **Last Observation:** | 2005-08 |
| **Eo Type:** | | **Eo Rank:** | | **Eo Rank Date:** | |

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Five burrowing owls seen on a Cynomys colony.

**Scientific Name:** ***Athene cunicularia*** **Occurrence #:** 83

**Common Name:** Burrowing Owl **SD Protection Status:**

**Location Information:** **Latitude:** 443957N **Longitude:** 1030936W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | 008N008E | 09 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Volunteer NW | SD |

**Directions:**

21.5 km ESE of Newell

**Survey Information:**

**First Observation:** 2005-08 **Survey Date:** **Last Observation:** 2005-08

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Four burrowing owls seen on a Cynomys colony.

**Scientific Name:** ***Athene cunicularia*** **Occurrence #:** 238

**Common Name:** Burrowing Owl **SD Protection Status:**

**Location Information:** **Latitude:** 444331N **Longitude:** 1031807W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | | | | |
| | | | 009N007E | 19 | BH | |
| | | | 009N007E | 29 | BH | |
| | | | 009N007E | 20 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Vale NE | SD |

**Directions:**

about 5 miles SW of Newell

**Survey Information:**

**First Observation:** 2005-08 **Survey Date:** **Last Observation:** 2011-07-14

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General** 358 acre prairie dog town
**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** In 2005 3 owls were seen in this town. In 2011, adults was seen at a burrow with shredded manure and prey remains.

**Scientific Name:** ***Athene cunicularia*** **Occurrence #:** 253

**Common Name:** Burrowing Owl **SD Protection Status:**

**Location Information:** **Latitude:** 444949N **Longitude:** 1031825W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | 010N007E | 18 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Schoepp Flat | SD |

**Directions:**

Butte County, T10N R7E S18 E1/2, CRP grassland

**Survey Information:**

**First Observation:** 2012-06-01 **Survey Date:** **Last Observation:** 2012-06-01

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General** CRP grassland

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** one pair observed

**Scientific Name:** ***Buteo regalis*** **Occurrence #:** 89

**Common Name:** Ferruginous Hawk **SD Protection Status:**

**Location Information:** **Latitude:** 444755N **Longitude:** 1031749W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | 010N007E | 29 | BH | SEC. 19,20,21,28,30,31,32,33 |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Schoepp Flat | SD |

**Directions:**

SIX MILES EAST AND SIX MILES NORTH OF NEWELL; SD BBA 01R06

**Survey Information:**

**First Observation:** 1989-06-04 **Survey Date:** **Last Observation:** 1989-06-04

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General** SD BBA CODE N-03=NATIVE GRASSLANDS

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** CONFIRMED NESTING-OCCUPIED NEST

**Scientific Name:** ***Buteo swainsoni*** **Occurrence #:** 53

**Common Name:** Swainson's Hawk **SD Protection Status:**

**Location Information:** **Latitude:** 450141N **Longitude:** 1031344W

| Watershed Code | Watershed | Township | | | |
|---|---|---|---|---|---|
| | | Range | Section | Meridian | TRS_Note |
| 10130304 | South Fork Moreau | | | | |
| | | 012N007E | 02 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Deers Ears Butte North | SD |

**Directions:**

About 23 miles NE of Newell

**Survey Information:**

| | | | | | |
|---|---|---|---|---|---|
| **First Observation:** | 2005 | **Survey Date:** | | **Last Observation:** | 2005-05 |
| **Eo Type:** | | **Eo Rank:** | | **Eo Rank Date:** | |

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Active nest in green ash tree, located during aerial survey

**Scientific Name:** ***Buteo swainsoni*** **Occurrence #:** 54

**Common Name:** Swainson's Hawk **SD Protection Status:**

**Location Information:** **Latitude:** 445613N **Longitude:** 1030831W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120113 | Cherry | | | | |
| | | 011N008E | 09 | BH | |
| | | 011N008E | 03 | BH | |
| | | 011N008E | 10 | BH | |
| | | 011N008E | 04 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Deers Ears Butte South | SD |

**Directions:**

20.5 miles NE of Newell

**Survey Information:**

| | | | | | |
|---|---|---|---|---|---|
| **First Observation:** | 2005 | **Survey Date:** | | **Last Observation:** | 2005-05 |
| **Eo Type:** | | **Eo Rank:** | | **Eo Rank Date:** | |

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Active nest in willow tree, located during aerial survey

**Scientific Name:** ***Buteo swainsoni*** **Occurrence #:** 55

**Common Name:** Swainson's Hawk **SD Protection Status:**

**Location Information:** **Latitude:** 445027N **Longitude:** 1032938W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | 010N005E | 10 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Newell Lake | SD |

**Directions:**

About 9.5 miles NNW of Newell

**Survey Information:**

**First Observation:** 2005 **Survey Date:** **Last Observation:** 2005-05

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Active nest located during aerial survey, in cottonwood tree.

**Scientific Name:** ***Buteo swainsoni*** **Occurrence #:** 58

**Common Name:** Swainson's Hawk **SD Protection Status:**

**Location Information:** **Latitude:** 450017N **Longitude:** 1030741W

| Watershed Code | Watershed | Township | | | |
|---|---|---|---|---|---|
| | | Range | Section | Meridian | TRS_Note |
| 10130304 | South Fork Moreau | | | | |
| | | 012N008E | 15 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Tomato Can Buttes | SD |
| | | Deers Ears Butte North | SD |

**Directions:**

About 25 miles NE of Newell

**Survey Information:**

**First Observation:** 2005 **Survey Date:** **Last Observation:** 2005-05

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Active nest located during aerial survey, in green ash tree

**Scientific Name:** ***Catostomus platyrhynchus*** **Occurrence #:** 43

**Common Name:** Mountain Sucker **SD Protection Status:**

**Location Information:** **Latitude:** 443714N **Longitude:** 1032819W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | 008N005E | 26 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Vale | SD |

**Directions:**

Whitewood creek, three miles west of Vale<br>

**Survey Information:**

| | | | | | |
|---|---|---|---|---|---|
| **First Observation:** | 2010-10-13 | **Survey Date:** | | **Last Observation:** | 2011-10-31 |
| **Eo Type:** | | **Eo Rank:** | | **Eo Rank Date:** | |

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** In 2010, nine individuals caught, 8 were released and one was sacrificed for tissue sampling.<br>In 2011, 14 individuals caught and released<br>

**Scientific Name:** ***Grus americana*** **Occurrence #:** 31

**Common Name:** Whooping Crane **SD Protection Status:** SE

**Location Information:** **Latitude:** 445840N **Longitude:** 1025035W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120113 | Cherry | 012N010E | | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Meade | SD | Frozen Man Creek | SD |

**Directions:**

SE OF MUD BUTTE.

**Survey Information:**

**First Observation:** 1972 **Survey Date:** **Last Observation:** 1972-10-10

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:** CONFIRMED SIGHTING.

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** 2 INDIVIDUALS OBSERVED 10 OCTOBER 1972.

**Scientific Name:** ***Grus americana*** **Occurrence #:** 32

**Common Name:** Whooping Crane **SD Protection Status:** SE

**Location Information:** **Latitude:** 445640N **Longitude:** 1030625W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS Note |
|---|---|---|---|---|---|
| 10120113 | Cherry | 011N008E | 2 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Owl Butte NE | SD |

**Directions:**

NE OF NEWELL, 4 MI S, 3 MI E OF DEER'S EARS BUTTE.

**Survey Information:**

**First Observation:** 1972 **Survey Date:** **Last Observation:** 1972-09-18

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:** CONFIRMED SIGHTING.

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** 1 INDIVIDUAL OBSERVED 18 SEPTEMBER 1972.

**Scientific Name:** ***Haliaeetus leucocephalus*** **Occurrence #:** 21

**Common Name:** Bald Eagle **SD Protection Status:** ST

**Location Information:** **Latitude:** 443355N **Longitude:** 1031019W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | 007N008E | 17 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Meade | SD | Volunteer | SD |

**Directions:**

BELLE FOURCHE RIVER, 3.5 MILES NORTH AND 2 MILES WEST OF VOLUNTEER<br />-or- 4 miles north of Hwy 34 on the

Belle Fourche river.

**Survey Information:**

**First Observation:** 1996 **Survey Date:** **Last Observation:** 2012

**Eo Type:** BREEDING SITE - migratory animals **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General** RIPARIAN AREA ALONG PRAIRIE RIVER

**Description:**

**Comments:** LOCAL LANDOWNERS REPORT THAT THIS NEST HAS BEEN ACTIVE FOR 3-4 YEARS. LAND IS LEASED TO TOM CASTELL OF VALE.

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** ONE EAGLET OBSERVED IN NEST, ONE ADULT PERCHED NEARBY. 1997-ONE ADULT AT NEST AND ONE EAGLET IN NEST. 1998-ADULT INCUBATING. 1999-US FWS PILOT REPORTED ONE ADULT AND ONE EAGLET

IN NEST, APPARENTLY SAME NEST AS USED IN PAST. 2004--Nest occupied with 1 fledged. 2005-one young fledged and 2 fledged in 2006. Active in 2009, unknown if successful. Active in 2010, fledged 2 young. Unknown status in 2011. Active in 2012, fledged 2 young. Active in 2013, fledged at least one young. Unknown status in 2014.

**Scientific Name:** ***Haliaeetus leucocephalus*** **Occurrence #:** 120

**Common Name:** Bald Eagle **SD Protection Status:** ST

**Location Information:** **Latitude:** 443849N **Longitude:** 1031937W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | | | |
| | | 008N007E | 18 | BH | |
| | | 008N006E | 13 | BH | |
| | | 008N006E | 24 | BH | |
| | | 008N007E | 19 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Vale NE | SD |

**Directions:**

E of river, in strin of trees between 2 fields

**Survey Information:**

| | | | | | |
|---|---|---|---|---|---|
| **First Observation:** | 2009 | **Survey Date:** | | **Last Observation:** | 2011 |
| **Eo Type:** | | **Eo Rank:** | | **Eo Rank Date:** | |

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Active nest in 2009, fledged one young. There are two nests about 100 ft apart, both worked on in 2009. Active in 2010, fledged one young. Active in 2011, fledged one young.Inactive in 2012-2014.

**Scientific Name:** ***Haliaeetus leucocephalus*** **Occurrence #:** 121

**Common Name:** Bald Eagle **SD Protection Status:** ST

**Location Information:** **Latitude:** 443900N **Longitude:** 1032740W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | 008N005E | 13 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Newell | SD |

**Directions:**

Belle Fourche River about one mile upstream from the confluence with Whitewood Creek.

**Survey Information:**

| | | | | | |
|---|---|---|---|---|---|
| **First Observation:** | 2009 | **Survey Date:** | | **Last Observation:** | 2009 |
| **Eo Type:** | | **Eo Rank:** | | **Eo Rank Date:** | |

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Active nest, success status unknown. Unknown in 2010 and 2011. Inactive in 2012, canada goose using nest.Unknown status in 2013 and 2014.

**Scientific Name:** ***Haliaeetus leucocephalus*** **Occurrence #:** 139

**Common Name:** Bald Eagle **SD Protection Status:** ST

**Location Information:** **Latitude:** 443537N **Longitude:** 1031301W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | 007N007E | 01 | BH | |
| | | 007N007E | 12 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Meade | SD | Volunteer | SD |

**Directions:**

**Survey Information:**

| | | | | | |
|---|---|---|---|---|---|
| **First Observation:** | 2009 | **Survey Date:** | | **Last Observation:** | 2010 |
| **Eo Type:** | | **Eo Rank:** | | **Eo Rank Date:** | |

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Active nest, unknown if successful. Unknown in 2010 and 2011. Nest absent in 2012.

**Scientific Name:** ***Haliaeetus leucocephalus*** **Occurrence #:** 161

**Common Name:** Bald Eagle **SD Protection Status:** ST

**Location Information:** **Latitude:** 443456N **Longitude:** 1031318W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | | | |
| | | 007N007E | 11 | BH | |
| | | 007N007E | 12 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Meade | SD | Volunteer | SD |

**Directions:**

Meade County

**Survey Information:**

| | | | | | |
|---|---|---|---|---|---|
| **First Observation:** | 2010 | **Survey Date:** | | **Last Observation:** | 2010 |
| **Eo Type:** | | **Eo Rank:** | | **Eo Rank Date:** | |

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** Fledged one young in 2010. Unknown in 2011, could not located nest from plane, likely fell. Could not find nest again in 2012.

**Scientific Name:** ***Lower perennial stream*** **Occurrence #:** 4

**Common Name:** **SD Protection Status:**

**Location Information:** **Latitude:** 442903N **Longitude:** 1030647W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | 006N008E | 14 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Meade | SD | Rapid City 1 NE | SD |
| Butte | SD | Volunteer | SD |

Hereford SD

**Directions:**

BELLE FOURCHE RIVER FROM REDWATER RIVER CONFLUENCE DOWNSTREAM TO CHEYENNE RIVER CONFLUENCE.

**Survey Information:**

**First Observation:** 1978 **Survey Date:** **Last Observation:** 1982

**Eo Type:** **Eo Rank:** B **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General Description:** DRAINAGE AREA OF 7210 SQ.MI. AVERAGE DISCHARGE=362 CFS NEAR ELM SPRINGS. FLOWS THROUGH PLAINS.

**Comments:** 155 MI OF CANOE STREAM BETWEEN BELLE FOURCHE (HWY 85) AND CHEYENNE RIVER CONFLUENCE.

**Protection**

**Comments:**

**Management** IRRIGATION DIVERSIONS FOR 60,000 ACRES ABOVE ELM SPRINGS.

**Comments:**

**Data:** APPROX 125 MI. RATED CLASS 2 (HIGH PRIORITY)FISHERY RESOURCEBY M78FWS01. OUTSTANDING FISH VALUE IDENTIFIED BY B82NPS01 (REPEAT OF M78FWS01 DATA). FLOW REGULATED BY KEYSTONE RESERVOIR. 3 EPISODES OF NO FLOW IN 52 YEARS OF RECORDS.

**Scientific Name:** ***Mimus polyglottos*** **Occurrence #:** 5

**Common Name:** Northern Mockingbird **SD Protection Status:**

**Location Information:** **Latitude:** 443525N **Longitude:** 1030025W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | 007N009E | 3 | BH | SE4SE4 |

| County Name | State | Quadrangle | State |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Meade | SD | Volunteer SE | SD |

**Directions:**

ABOUT 5 MILES NE OF POINT WHERE HIWAY 34 CROSSES BELLE FOURCHE RIVER. THE LEGAL DESCRIPTION DOES NOT AGREE WITH DIRECTIONS GIVEN IN WHITNEY'S LETTER, WHICH ARE SDOU ATLAS BLOCK 4-R-1, (SEC. 19,20,21,28,29,30,31,32,33)

**Survey Information:**

| | | | | | |
|---|---|---|---|---|---|
| **First Observation:** | 1988 | **Survey Date:** | | **Last Observation:** | 1988-06-22 |
| **Eo Type:** | | **Eo Rank:** | | **Eo Rank Date:** | |

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:** OBSERVED BY ERNIE MILLER, RICHARD PETERSON, AND NAT WHITNEY. LETTER IN CORRESPONDENCE FILE, JAN. 28,1992, FROM WHITNEY.

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** PAIR WITH TWO YOUNG

**Scientific Name:** ***Numenius americanus*** **Occurrence #:** 23

**Common Name:** Long-billed Curlew **SD Protection Status:**

**Location Information:** **Latitude:** 443210N **Longitude:** 1031634W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | 007N007E | 28 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Meade | SD | Vale SE | SD |

**Directions:**

EIGHT MILES EAST AND 5 MILES NORTH OF BEAR BUTTE PEAK.

**Survey Information:**

| | | | | | |
|---|---|---|---|---|---|
| **First Observation:** | 1990 | **Survey Date:** | | **Last Observation:** | 1990-06-08 |
| **Eo Type:** | | **Eo Rank:** | | **Eo Rank Date:** | |

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** CONFIRMED NESTING, PRECOCIAL YOUNG

**Scientific Name:** ***Numenius americanus*** **Occurrence #:** 29

**Common Name:** Long-billed Curlew **SD Protection Status:**

**Location Information:** **Latitude:** 444800N **Longitude:** 1031731W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | 010N007E | 29 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Schoepp Flat | SD |

**Directions:**

RANDOM BLOCK 01R06 SD BREEDING BIRD ATLAS; 9 SQUARE MILE BLOCK 6 MILES NE OF NEWELL

**Survey Information:**

| | | | | | |
|---|---|---|---|---|---|
| **First Observation:** | 1989 | **Survey Date:** | | **Last Observation:** | 1989-06-04 |
| **Eo Type:** | | **Eo Rank:** | | **Eo Rank Date:** | |

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:** SD BREEDING BIRD ATLAS RANDOM BLOCK 01R06

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** CONFIRMED NESTING, PRECOCIAL YOUNG

**Scientific Name:** ***Numenius americanus*** **Occurrence #:** 30

**Common Name:** Long-billed Curlew **SD Protection Status:**

**Location Information:** **Latitude:** 443220N **Longitude:** 1030311W

| Watershed Code | Watershed | Township Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | 007N009E | 29 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Meade | SD | Volunteer SE | SD |

**Directions:**

ABOUT 3.5 MILES NE OF HWY 34 BRIDGE OVER BELLE FOURCHE RIVER. SD BREEDING BIRD ATLAS RANDOM BLOCK

04R01

**Survey Information:**

**First Observation:** 1992 **Survey Date:** **Last Observation:** 1992-05-23

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:** SD BBA RANDOM BLOCK 04R01

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** CONFIRMED NESTING, NEST WITH EGGS

**Scientific Name:** ***Numenius americanus*** **Occurrence #:** 44

**Common Name:** Long-billed Curlew **SD Protection Status:**

**Location Information:** **Latitude:** 444057N **Longitude:** 1031136W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|---|
| 10120202 | Lower Belle Fourche | | 008N008E | 06 | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Volunteer NW | SD |

**Directions:**

Hugo Recherche rd

**Survey Information:**

**First Observation:** 2012-06-20 **Survey Date:** **Last Observation:** 2012-06-20

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General** pastureland

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** two chicks observed

**Scientific Name:** ***Phrynosoma hernandesi*** **Occurrence #:** 4

**Common Name:** Short-horned Lizard **SD Protection Status:**

**Location Information:** **Latitude:** 445237N **Longitude:** 1024348W

| Watershed Code | Watershed | Township | Range | Section | Meridian | TRS_Note |
|---|---|---|---|---|---|---|
| 10120113 | Cherry | | 011N011E | | BH | |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Meade | SD | Big Draw | SD |
| | | Squaw Buttes | SD |

**Directions:**

10 MI SE OF MUD BUTTE NEAR SULPHER CREEK.

**Survey Information:**

**First Observation:** 1968 **Survey Date:** **Last Observation:** 1968-07

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General** IN SANDY AREA AT BASE OF RIMROCK.

**Description:**

**Comments:**

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** MUS#3122,3123, COLLECTED BY TIMKEN AND POLCYN.

**Scientific Name:** ***Vulpes velox*** **Occurrence #:** 5

**Common Name:** Kit or Swift Fox **SD Protection Status:** ST

**Location Information:** **Latitude:** 445908N **Longitude:** 1031937W

| Watershed Code | Watershed | Township / Range | Section | Meridian | TRS Note |
|---|---|---|---|---|---|
| 10130304 | South Fork Moreau | 012N006E | 24 | BH | SE4 |

| County Name | State | Quadrangle | State |
|---|---|---|---|
| Butte | SD | Sulphur Butte | SD |

**Directions:**

4 MI NE OF CASTLE ROCK (TOWN).

**Survey Information:**

**First Observation:** 1970 **Survey Date:** **Last Observation:** 1970-12

**Eo Type:** **Eo Rank:** **Eo Rank Date:**

**Observed Area:**

**Comments:**

**General**

**Description:**

**Comments:** REPORTED BY ROBERT A.KRIEGE-FWS.

**Protection**

**Comments:**

**Management**

**Comments:**

**Data:** SWIFT FOX OBSERVED IN DECEMBER OF 1970.

Appendix B-1

Consistency Evaluation Forms for Species Protected Under the Endangered Species Act

(Provided under separate cover)

# Appendix B-2

## Programmatic Biological Assessment Project Consistency Evaluation Form
## Upper Great Plains Region Wind Energy Development Program

(Provided under separate cover)

# APPENDIX C - CULTURAL RESOURCES IDENTIFIED WITHIN AREA OF POTENTIAL EFFECT

Table 31. Willow Creek Wind Energy Facility Cultural Resources and Recommendations

| Site Number | Type | NRHP Recommendation/Criteria | APE & Potential Effect |
|---|---|---|---|
| ***Direct APE*** | | | |
| 39BU0145 | Native American Isolated Find & Cairn | Eligible – Criterion D | In Direct APE Will be avoided, No effect |
| 39BU0146 | Native American Artifact Scatter | Unevaluated | In Direct APE Will be avoided, No effect |
| 39BU0147 | Native American Stone Circle & Isolated Find | Unevaluated | In Direct APE Will be avoided, No effect |
| 39BU0148 | Native American Stone Circle; Cairn | Unevaluated | In Direct APE Will be avoided, No effect |
| 39BU0158 | Native American Stone Circle & Artifact Scatter | Eligible – Criterion D | In Direct APE Will be avoided, No effect |
| 39BU0529 | Euro-American Artifact Scatter | Not Eligible | In Direct APE Will be avoided, No effect |
| 39BU0530 | Native American Alignment | Not Eligible | In Direct APE Will be avoided, no effect |
| 39BU0531 | Native American Alignment | Not Eligible | In Direct APE Will be avoided, No effect |
| 39BU0532 | Native American Stone Circle & Hearth | Eligible – Criterion D | In Direct APE Avoid – No Effect |
| 39BU0533 | Native American Stone Circle | Eligible – Criterion D | In Direct APE Will be avoided, No effect |
| 39BU0534 | Euro-American Foundation & Artifact Scatter | Not Eligible | In Direct APE Will be avoided, No effect |
| 39BU0535 | Native American Stone Circle & Alignment | Eligible – Criterion D | In Direct APE Will be avoided, No effect |
| 39BU0536 | Euro-American Cairn | Not Eligible | In Direct APE Will be avoided, no effect |
| 39BU0537 | Native American Cairn | Eligible – Criterion D | In Direct APE Will be avoided, No effect |
| 39BU0538 | Native American Cairn & Stone Circle | Eligible – Criterion D | In Direct APE Will be avoided, No effect |
| 39BU0539 | Native American Stone Circle | Eligible – Criterion D | In Direct APE Avoid - Move Turbine No effect |
| 39BU0540 | Euro-American Artifact Scatter & Cairn | Not Eligible | In Direct APE Will be avoided, No effect |

| Site Number | Type | NRHP Recommendation/Criteria | APE & Potential Effect |
|---|---|---|---|
| ***Direct APE continued*** | | | |
| 39BU0541 | Native American Stone Circle & Isolated Find | Eligible – Criterion D | In Direct APE Will be avoided, No effect |
| 39BU0542 | Euro-American Cairn | Not Eligible | In Direct APE Will be avoided, No effect |
| 39BU0543 | Euro-American Dam | Not Eligible | In Direct APE Will be avoided, No effect |
| BU00000246 | Milton Herbrick Homestead | Not Eligible | In Direct APE Will be avoided, no effect |
| BU00000247 | William Greenberg Homestead | Not Eligible | In Direct APE Will be avoided, No effect |
| ***Visual APE*** | | | |
| 39BU0014 | Stone Circle | Eligible – Criterion D | In Visual APE Will be avoided, No effect |
| 39BU0142 | Native American Stone Circle & Cairn | Eligible – Criterion D | In Visual APE Will be avoided, No effect |
| 39BU0143 | Native American Stone Circle & Artifact Scatter | Eligible – Criterion D | In Visual APE Will be avoided, No effect |
| 39BU0144 | Native American Isolated Find | Not Eligible | In Visual APE Will be avoided, No effect |
| BU0030001 | Oscar 1 Launch Control Building | Eligible | In Visual APE Will be avoided No Adverse Effect |
| BU0030002 | Oscar 1 Maintenance Building | Eligible | In Visual APE Will be avoided No Adverse Effect |
| BU0030003 | Minuteman II Missile Silo Oscar-8 | Eligible | In Visual APE Will be avoided No Adverse Effect |
| BU0030004 | Minuteman II Missile Silo Oscar-6 | Eligible | In Visual APE Will be avoided No Adverse Effect |

# APPENDIX D - BEST MANAGEMENT PRACTICES AND CONSERVATION MEASURES

# BEST MANAGEMENT PRACTICES AND CONSERVATION MEASURES

This appendix presents the Best Management Practices (BMPs) and conservation measures, derived from the Upper Great Plains Wind Energy Final Programmatic Environmental Impact Statement (PEIS), that Wind Quarry has committed to implement for the Willow Creek Wind Energy Facility Project.

## Land Cover and Land Use (PEIS Section 5.1.2):

LU-1. Develop restoration plans to ensure that all temporary use areas are restored.

LU-2. Construction activities shall be coordinated with landowners to minimize interference with farming or livestock operations. Issues that would need to be addressed could include installation of gates and cattle guards where access roads cross existing fencelines, access control, signing of open range areas, traffic management (e.g., vehicle speed management), and location of livestock water sources.

LU-3. Construction debris shall be removed from the site.

LU-4. Excess concrete (excluding belowground portions of decommissioned turbine foundations intentionally left in place) shall not be buried or left in active agricultural areas.

LU-5. Vehicles shall be washed outside of active agricultural areas to minimize the possibility of the spread of noxious weeds.

LU-6. Topsoil shall be stripped from any agricultural area used for traffic or vehicle parking—segregating topsoil from excavated rock and subsoil—and replaced during restoration activities.

LU-7. Drainage problems caused by construction shall be corrected to prevent damage to agricultural fields.

LU-8. Following completion of construction and during decommissioning, subsoil shall be decompacted.

LU-9. Adequate safety measures (e.g., access control and traffic management) shall be established for recreational visitors to adjacent properties.

LU-10. Access roads shall be designed and constructed to the appropriate standard necessary to accommodate their intended function (e.g., traffic volume and weight of vehicles) and minimize erosion. Access roads that are no longer needed should be recontoured and revegetated.

LU-11. A transportation plan shall be prepared that identifies measures the developer will implement to comply with State or Federal requirements and to obtain the necessary permits. This will address the transport of turbine components, main assembly crane, and other large pieces of equipment. The plan shall consider specific object size, weight, origin, destination, and

unique handling requirements and shall evaluate alternative means of transportation (e.g., rail or barge).

LU-12. A traffic management plan shall be prepared for the site access roads to ensure that no hazards would result from increased truck traffic and that traffic flow would not be adversely impacted. This plan shall identify measures that will be implemented to comply with any State or Federal DOT requirements, such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configurations. Signs shall be placed along roads to identify speed limits, travel restrictions, and other standard traffic control information. To minimize impacts on local communities, consideration shall be given to limiting construction vehicles on public roadways during the morning and late afternoon commute times.

LU-13. Project personnel and contractors shall be instructed and required to adhere to speed limits commensurate with road types, traffic volumes, vehicle types, and site-specific conditions to ensure safe and efficient traffic flow.

LU-14. During construction, operations and maintenance, and decommissioning phases, traffic shall be restricted to designated project roads. Use of other unimproved roads shall be restricted to emergency situations.

## Soil Resources (PEIS Section 5.2.3):

SR-1. Minimize ground-disturbing activities, especially during the rainy season.

SR-2. Surface new roads with aggregate materials, wherever appropriate.

SR-3. Restrict heavy vehicles and equipment to improved roads to the extent practicable.

SR-4. Control vehicle and equipment speed on unpaved surfaces.

SR-5. Conduct construction and maintenance activities when the ground is frozen or when soils are dry and native vegetation is dormant.

SR-6. Stabilize disturbed areas that are not actively under construction using methods such as erosion matting or soil aggregation, as site conditions warrant.

SR-7. Salvage topsoil from all excavation and construction activities to reapply to disturbed areas once construction is completed.

SR-8. Dispose of excess excavation materials in approved areas to control erosion.

SR-9. Isolate excavation areas (and soil piles) from surface water bodies using silt fencing, bales, or other accepted appropriate methods to prevent sediment transport by surface runoff.

SR-10. Use earth dikes, swales, and lined ditches to divert local runoff around the work site.

SR-11. Reestablish the original grade and drainage pattern to the extent practicable.

SR-12. Reseed disturbed areas with a native seed mix and revegetate disturbed areas immediately following construction.

## Water Resources (PEIS Section 5.3.2):

WR-1. Apply standard erosion control BMPs to all construction activities and disturbed areas (e.g., sediment traps, water barriers, erosion control matting) as applicable to minimize erosion and protect water quality.

WR-2. Apply erosion controls relative to possible soil erosion from vehicular traffic.

WR-3. Construct drainage ditches only where necessary; use appropriate structures at culvert outlets to prevent erosion.

WR-4. Avoid altering existing drainage systems, especially in sensitive areas such as erodible soils or steep slopes.

WR-5. Clean and maintain catch basins, drainage ditches, and culverts regularly.

WR-6. Limit herbicide and pesticide use to nonpersistent, immobile compounds and apply them using a properly licensed applicator in accordance with label requirements.

WR-7. Dispose of excess excavation materials in approved areas to control erosion and minimize leaching of hazardous materials.

WR-8. Reestablish the original grade and drainage pattern to the extent practicable.

WR-9. Reseed (non-cropland) disturbed areas with a native seed mix and revegetate disturbed areas immediately following construction.

WR-10. When decommissioning sites, ensure that any wells are properly filled and capped.

## Air Quality and Climate (PEIS Section 5.4.2):

AQ-1. Use surface access roads, on-site roads, and parking lots with aggregates or that maintain compacted soil conditions to reduce dust generation.

AQ-2. Post and enforce lower speed limits on dirt and gravel access roads to minimize airborne fugitive dust.

AQ-3. Minimize potential environmental impacts from the use of dust palliatives by taking the necessary measures to keep the chemicals out of sensitive terrestrial habitats and streams. The application of dust palliatives must comply with Federal, State, and local laws and regulations.

AQ-4. Ensure that all pieces of heavy equipment meet emission standards specified in the State Code of Regulations, and conduct routine preventive maintenance, including tune-ups to manufacturer specification to ensure efficient combustion and minimum emissions. If possible, equipment with more stringent emission controls should be leased or purchased.

AQ-5. Employ fuel diesel engines in facility construction and maintenance that use ultra-low sulfur diesel, with a maximum 15 ppm sulfur content.

AQ-6. Limit idling of diesel equipment to no more than 10 minutes unless necessary for proper operation.

AQ-7. Stage construction activities to limit the area of disturbed soils exposed at any particular time.

AQ-8. 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.

AQ-9. Install wind fences around disturbed areas if windborne dust is likely to impact sensitive areas beyond the site boundaries (e.g., nearby residences).

AQ-10. Spray stockpiles of soils with water, cover with tarpaulins, and/or treat with appropriate dust suppressants, especially when high wind or storm conditions are likely. Vegetative plantings may also be used to limit dust generation for stockpiles that will be inactive for relatively long periods.

AQ-11. Train workers to comply with speed limits, use good engineering practices, minimize the drop height of excavated materials, and minimize disturbed areas.

AQ-12. Cover vehicles transporting loose materials when traveling on public roads, and keep loads sufficiently wet and below the freeboard of the truck in order to minimize wind dispersal.

AQ-13. Inspect and clean tires of construction-related vehicles, as necessary, so they are free of dirt prior to entering paved public roadways.

AQ-14. Clean (e.g., through street vacuum sweeping) visible trackout or runoff dirt from the construction site off public roadways..

## Noise Impacts (PEIS Section 5.5.2):

NI-1. Select equipment with the lowest noise levels available and no prominent discrete tones, when possible.

NI-2. Maintain all equipment in good working order in accordance with manufacturer specifications. Suitable mufflers and/or air-inlet silencers should be installed on all internal combustion engines and certain compressor components.

NI-3. All vehicles traveling within and around the project area should operate in accordance with posted speed limits.

NI-4. Establish a process for documenting, investigating, evaluating, and resolving project-related noise complaints.

NI-5. When possible, limit noisy construction activities to times when nearby sensitive receptors are least likely to be disturbed.

NI-6. Schedule noisy activities to occur at the same time whenever feasible, since additional sources of noise generally do not greatly increase noise levels at the site boundary. Less-frequent but noisy activities would generally be less annoying than lower-level noises occurring more frequently.

NI-7. Locate stationary construction equipment (e.g., compressors or generators) as far as practical from nearby sensitive receptors.

NI-8. In the unlikely event that blasting or pile driving would be needed during the construction period, notify nearby residents in advance.

## Ecological Resources (PEIS Section 5.6.2):

ER-1. The transmission lines shall be designed and constructed with regard to the recommendations in *Avian Protection Plan Guidelines* (APLIC and USFWS 2005), in conjunction with *Suggested Practices for Avian Protection on Power Lines* (APLIC 2006) and *Reducing Avian Collisions with Power Lines* (APLIC 2012), to reduce the operational and avian risks that result from avian interactions with electric utility facilities.

ER-2. Minimize the area disturbed during the installation of meteorological towers (i.e., the footprint needed for meteorological towers and associated laydown areas).

ER-3. Schedule the installation of meteorological towers and other characterization activities to avoid disruption of wildlife reproductive activities or other important behaviors (e.g., do not install towers during periods of sage-grouse nesting).

ER-4. Reduce habitat disturbance by keeping vehicles on access roads and minimizing foot and vehicle traffic through undisturbed areas.

ER-5. Instruct employees, contractors, and site visitors to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. Pets shall not be allowed on the project area.

ER-6. Establish buffer zones around known raptor nests, bat roosts, and biota and habitats of concern if site evaluations show that proposed construction activities would pose a significant risk to avian or bat species of concern.

ER-7. If needed during construction, only use explosives within specified times and at specified distances from sensitive wildlife or surface waters as established by the appropriate Federal and State agencies.

ER-8. Minimize the use of guy wires on permanent meteorological towers or use designs for towers that do not require guy wires. If guy wires are necessary, they shall be equipped with line marking devices.

ER-9. Initiate habitat restoration of disturbed soils and vegetation as soon as possible after construction activities are completed. Restore areas of disturbed soil using weed-free native grasses, forbs, and shrubs, in consultation with land managers and appropriate agencies such as State or County extension offices or weed boards.

ER-10. Minimize the amount of lighting installed on project turbines; all outdoor lighting on project buildings shall be downshielded.

ER-11. Develop a plan for control of noxious weeds and invasive plants that could occur as a result of new surface disturbance activities at the site. The plan shall address monitoring, weed identification, the manner in which weeds spread, and methods for treating infestations. Require the use of certified weed-free mulching.

ER-12. Establish a controlled inspection and cleaning area for trucks and construction equipment are arriving from locations with known invasive vegetation problems. Visually inspect construction equipment arriving at the project area and remove and contain seeds that may be adhering to tires and other equipment surfaces.

ER-13. Regularly monitor access roads and newly established utility and transmission line corridors for the establishment of invasive species. Initiate weed control measures immediately upon evidence of the introduction or establishment of invasive species.

ER-14. Place marking devices on any newly constructed or upgraded transmission lines, where appropriate, within suitable habitats for sensitive bird species.

ER-15. Promptly dispose of all garbage or human waste generated on site in order to avoid attracting nuisance wildlife.

ER-16. Do not use fill materials that originate from areas with known invasive vegetation problems.

ER-17. Access roads, utility and transmission line corridors, and tower site areas shall be monitored regularly for the establishment of invasive species, and weed control measures should be initiated immediately upon evidence of the introduction of invasive species.

ER-18. Regularly inspect access roads, utility and transmission line corridors, and tower site areas for damage from erosion, washouts, and rutting. Initiate corrective measures immediately upon evidence of damage.

ER-19. Turn off unnecessary lighting at night to limit attraction of migratory birds. Follow lighting guidelines, where applicable, from the *Wind Energy Guidelines Handbook*. This includes

using lights with timed shutoff, downward-directed lighting to minimize horizontal or skyward illumination, and avoidance of steady-burning, high-intensity lights.

ER-20. Increasing turbine cut-in speeds (i.e., prevent turbine rotation at lower wind velocity) in areas of bat conservation concern during times when active bats may be at particular risk from turbines.

ER-21. Instruct employees, contractors, and site visitors to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. Pets should not be allowed on the project area.

ER-22. In the absence of long-term mortality studies, monitor regularly for potential wildlife problems including wildlife mortality. Report observations of potential wildlife problems, including wildlife mortality, to the appropriate State or Federal agency in a timely manner, and work with the agencies to utilize this information to avoid/minimize/offset impacts. The Ecological Services Division of the USFWS shall be contacted. Development of additional mitigation measures may be necessary.

ER-23. All turbines and ancillary structures shall be removed from the site during decommissioning.

ER-24. Salvage and reapply topsoil excavated during decommissioning activities to disturbed areas during final restoration activities.

ER-25. Reclaim areas of disturbed soil using weed-free native shrubs, grasses, and forbs. Restore the vegetation cover, composition, and diversity to values commensurate with the ecological setting.

## Visual Resources (PEIS Section 5.7.1.3):

VR-1. For ancillary buildings and other structures, low-profile structures shall be chosen whenever possible to reduce their visibility

VR-2. Color selections for turbines shall be made to reduce visual impact and shall be applied uniformly to tower, nacelle, and rotor, unless gradient or other patterned color schemes are used.

VR-3. Grouped structures shall all be painted the same color to reduce visual complexity and color contrast.

VR-4. For ancillary structures, materials and surface treatments shall repeat and/or blend with the existing form, line, color, and texture of the landscape. If the project will be viewed against an earthen or other non-sky background, appropriately colored materials shall be selected for structures, or appropriate stains/coatings shall be applied to blend with the project's backdrop.

VR-5. The operator shall use nonreflective paints and coatings on wind turbines, visible ancillary structures, and other equipment to reduce reflection and glare.

VR-6. Turbines, visible ancillary structures, and other equipment shall be painted before or immediately after installation.

VR-7. Lighting for facilities shall not exceed the minimum required for safety and security, and full-cutoff designs that minimize upward light scattering (light pollution) shall be selected. If possible, site design shall be accomplished to make security lights nonessential. Where they are necessary, security lights shall be extinguished except when activated by motion detectors (e.g., only around the substation).

VR-8. Commercial messages and symbols (such as logos, trademarks) on wind turbines shall be avoided and shall not appear on sites or ancillary structures of wind energy projects. Similarly, billboards and advertising messages shall also be discouraged.

VR-9. A site restoration plan shall be in place prior to construction. Restoration of the construction areas shall begin immediately after construction to reduce the likelihood of visual contrasts associated with erosion and invasive weed infestation and to reduce the visibility of affected areas as quickly as possible.

VR-10. Disturbed surfaces shall be restored to their original contours as closely as possible and revegetated immediately after, or contemporaneously with, construction. Prompt action shall be taken to limit erosion and to accelerate restoring the preconstruction color and texture of the landscape.

VR-11. Visual impact mitigation objectives and activities shall be discussed with equipment operators before construction activities begin.

VR-12. Existing rocks, vegetation, and drainage patterns shall be preserved to the maximum extent possible.

VR-13. Slash from vegetation removal shall be mulched and spread to cover fresh soil disturbances (preferred) or shall be buried. Slash piles shall not be left in sensitive viewing areas.

VR-14. Installation of gravel and pavement shall be avoided where possible to reduce color and texture contrasts with the existing landscape.

VR-15. For road construction, excess fill shall be used to fill uphill-side swales to reduce slope interruption that would appear unnatural and to reduce fill piles.

VR-16. The geometry of road ditch design shall consider visual objectives; rounded slopes are preferred to V-shaped and U-shaped ditches.

VR-17. Road-cut slopes shall be rounded, and the cut/fill pitch shall be varied to reduce contrasts in form and line; the slope shall be varied to preserve specimen trees and nonhazardous rock outcroppings.

VR-18. Planting pockets shall be left on slopes, where feasible.

VR-19. Benches shall be provided in rock cuts to accent natural strata.

VR-20. Topsoil from cut/fill activities shall be segregated and spread on freshly disturbed areas to reduce color contrast and aid rapid revegetation. Topsoil piles shall not be left in sensitive viewing areas.

VR-21. Excess fill material shall not be disposed of downslope in order to avoid creating color contrast with existing vegetation/soils.

VR-22. Excess cut/fill materials shall be hauled in or out to minimize ground disturbance and impacts from fill piles.

VR-23. Soil disturbance shall be minimized in areas with highly contrasting subsoil color.

VR-24. Natural or previously excavated bedrock landforms shall be sculpted and shaped when excavation of these landforms is required. A percentage of backslope, benches, and vertical variations shall be integrated into a final landform that repeats the natural shapes, forms, textures, and lines of the surrounding landscape. The earthen landform shall be integrated and transitioned into the excavated bedrock landform. Sculpted rock face angles, bench formations, and backslope need to adhere to the natural bedding planes of the natural bedrock geology. Half-case drill traces from pre-split blasting shall not remain evident in the final rock face. Where feasible, the color contrast shall be removed from the excavated rock faces by color-treating with a rock stain.

VR-25. Where feasible, construction on wet soils shall be avoided to reduce erosion.

VR-26. Communication and other local utility cables shall be buried, where feasible.

VR-27. Culvert ends shall be painted or coated to reduce color contrasts with existing landscape.

VR-28. Signage shall be minimized; reverse sides of signs and mounts shall be painted or coated to reduce color contrasts with the existing landscape.

VR-29. The burning of trash shall be prohibited during construction; trash shall be stored in containers and/or hauled off-site.

VR-30. Litter must be controlled and removed regularly during construction.

VR-31. Dust abatement measures shall be implemented in arid environments to minimize the impacts of vehicular and pedestrian traffic, construction, and wind on exposed surface soils.

VR-32. Wind facilities and sites shall be actively and carefully maintained during operation. Wind energy projects shall evidence environmental care, which would also reinforce the expectation and impression of good management for benign or clean power.

VR-33. Inoperative or incomplete turbines cause the misperception in viewers that "wind power does not work" or that it is unreliable. Inoperative turbines shall be repaired, replaced, or removed quickly. Nacelle covers and rotor nose cones shall always be in place and undamaged.

VR-34. Nacelles and towers shall be cleaned regularly (yearly, at minimum) to remove spilled or leaking fluids and the dirt and dust that accumulates, especially in seeping lubricants.

VR-35. Facilities and off-site surrounding areas shall be kept clean of debris, "fugitive" trash or waste, and graffiti. Scrap heaps and materials dumps shall be prohibited and prevented. Materials storage yards, even if thought to be orderly, shall be kept to an absolute minimum. Surplus, broken, disused materials and equipment of any size shall not be allowed to accumulate.

VR-36. Maintenance activities shall include dust abatement (in arid environments), litter cleanup, and noxious weed control.

VR-37. Road maintenance activities shall avoid blading of existing forbs and grasses in ditches and adjacent to roads; however, any invasive or noxious weeds shall be controlled as needed.

VR-38. Interim restoration shall be undertaken during the operating life of the project as soon as possible after disturbances.

VR-39. All aboveground and near-ground structures shall be removed.

VR-40. Soil borrow areas, cut-and-fill slopes, berms, waterbars, and other disturbed areas shall be contoured to approximate naturally occurring slopes, thereby avoiding form and line contrasts with the existing landscapes. Contouring to rough texture would trap seed and discourage off-road travel, thereby reducing associated visual impacts.

VR-41. Cut slopes shall be randomly scarified and roughened to reduce texture contrasts with existing landscapes and to aid in revegetation.

VR-42. Combining seeding, planting of nursery stock, transplanting of local vegetation within the proposed disturbance areas, and staging of construction shall be considered, enabling direct transplanting. Generally, native vegetation shall be used for revegetation, establishing a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape. Seed mixes shall be coordinated with local authorities, such as country extension services, weed boards, or land management agencies.

VR-43. Gravel and other surface treatments shall be removed or buried.

VR-44. Rocks, brush, and forest debris shall be restored, whenever possible, to approximate preexisting visual conditions.

## Cultural Resources (PEIS Section 5.9.1.6):

CR-1. Cultural resources discovered during construction shall immediately be brought to the attention of the responsible Federal agency. Work shall be immediately halted in the vicinity of the find to avoid further disturbance to the resources while they are being evaluated and appropriate mitigation plans are being developed.

CR-2. If human remains are found on a development site, work shall cease immediately in the vicinity of the find. The appropriate law enforcement officials and the appropriate Federal agency shall be contacted. No material shall be removed from the find location. Once it is determined that the remains belong to an archaeological site, the appropriate SHPO shall be contacted to determine how the remains shall be addressed.

## Hazardous Materials and Waste (PEIS Section 5.12.1.4):

HM-1. Prepare a hazardous materials and waste management plan that addresses the selection, transport, storage, and use of all hazardous materials needed for construction, operation, and decommissioning of the facility for local emergency response and public safety authorities and for the regulating agency, and that addresses the characterization, on-site storage, recycling, and disposal of all resulting wastes. The plan shall include a comprehensive hazardous materials inventory; Material Safety Data Sheets (MSDSs) for each type of hazardous material; emergency contacts and mutual aid agreements, if any; site map showing all hazardous materials and waste storage and use locations; copies of spill and emergency response plans (see below), and hazardous materials-related elements of a decommissioning/closure plan. The waste management plan shall identify the waste streams that are expected to be generated at the site during construction and operation and address hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements (e.g., selecting appropriate waste storage containers, appropriate off-site treatment, storage, and disposal facilities), inspection procedures, and waste minimization procedures. The plan shall address solid and liquid wastes that may be generated at the site in compliance with CWA requirements if a NPDES permit is needed.

HM-2. Develop a fire management and protection plan to implement measures to minimize the potential for fires associated with substances used and stored at the site. The flammability of the specific chemicals used at the facility shall be considered.

HM-3. If pesticides/herbicides are to be used on the site, develop an integrated pest and vegetation management plan to ensure that applications will be conducted within the framework of managing agencies and will entail the use of only EPA-registered pesticides/herbicides that are (1) nonpersistent and immobile and (2) applied by licensed applicators in accordance with label and application permit directions, following stipulations regarding suitability for terrestrial and aquatic applications.

HM-4. All site characterization, construction, operation, and decommissioning activities shall be conducted in compliance with applicable Federal and State laws and regulations, including the Toxic Substances Control Act of 1976, as amended (15 USC 2601, et seq.). In addition, any release of toxic substances (leaks, spills, and the like) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, Section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

HM-5. Pollution prevention opportunities shall be identified and implemented, including material substitution of less hazardous alternatives, recycling, and waste minimization.

HM-6. Systems containing hazardous materials shall be designed and operated in a manner that limits the potential for their release, and constructed of compatible materials in good condition (as verified by periodic inspections), including provision of secondary containment features (to the extent practical); installation of sensors or other devices to monitor system integrity; installation of strategically placed valves to isolate damaged portions and limit the amount of hazardous materials in jeopardy of release; and robust inspection and use of repair procedures.

HM-7. Dedicated areas with secondary containment shall be established for off-loading hazardous materials transport vehicles.

HM-8. To the greatest extent practicable, “just-in-time” ordering procedures shall be employed that would limit the amounts of hazardous materials present on the site to quantities minimally necessary to support continued operations. Excess hazardous materials shall receive prompt disposition.

HM-9. Written procedures for the storage, use, and transportation of each type of hazardous material present shall be provided, including all vehicle and equipment fuels.

HM-10. Authorized users for each type of hazardous material shall be identified.

HM-11. Procedures shall be established for fuel storage and dispensing, including shutting off vehicle (equipment) engines; using only authorized hoses, pumps, and other equipment in good working order; maintaining appropriate fire and spill response materials at equipment-fueling stations; providing emergency shutoffs for fuel pumps; ensuring that fueling stations are paved; ensuring that both aboveground fuel tanks and fueling areas have adequate secondary containment; prohibiting smoking, welding, or open flames in fuel storage and dispensing areas; equipping the area with fire suppression devices, as appropriate; conducting routine inspections of fuel storage and dispensing areas; requiring prompt recovery and remediation of all spills, and providing for the prompt removal of all fuel and fuel tanks used to support construction vehicles and equipment at the completion of facility construction and decommissioning phases.

HM-12. Refueling areas shall be located away from surface water locations and drainages and on paved surfaces; features shall be added to direct spilled materials to sumps or safe storage areas where they can be subsequently recovered.

HM-13. Drip pans shall be used under the fuel pump and valve mechanisms of any bulk fueling vehicles and during on-site refueling to contain accidental releases.

HM-14. Spills shall be immediately addressed per the appropriate spill management plan, and cleanup and removal initiated, if needed. Operations and maintenance personnel shall be trained in spill prevention and containment, and spill containment supplies shall be located on site and be readily available.

HM-15. All vehicles and equipment shall be in proper working condition to ensure that there is no potential for leaks of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials.

HM-16. Hazardous materials and waste storage areas or facilities shall be formally designated and access to them restricted to authorized personnel. Construction debris, especially treated wood, shall not be disposed of or stored in areas where it could come in contact with aquatic habitats.

HM-17. Design requirements shall be established for hazardous materials and waste storage areas that are consistent with accepted industry practices as well as applicable Federal, State, and local regulations and that include, at a minimum, containers constructed of compatible materials, properly labeled, and in good condition; secondary containment features for liquid hazardous materials and wastes; physical separation of incompatible chemicals; and fire-fighting capabilities when warranted.

HM-18. Written procedures shall be established for inspecting hazardous materials and waste storage areas and for plant systems containing hazardous materials; identified deficiencies and their resolution shall be documented.

HM-19. Schedules shall be established for the regular removal of wastes (including sanitary wastewater generated in temporary, portable sanitary facilities) for delivery by licensed haulers to appropriate off-site treatment or disposal facilities.

HM-20. During facility decommissioning, the following shall occur: emergency response capabilities shall be maintained throughout the decommissioning period as long as hazardous materials and wastes remain on-site, and emergency response planning shall be extended to any temporary material and equipment storage areas that may have been established; temporary waste storage areas shall be properly designated, designed, and equipped; hazardous materials removed from systems shall be properly containerized and characterized, and recycling options shall be identified and pursued; off-site transportation of recovered hazardous materials and wastes resulting from decommissioning activities shall be conducted by authorized carriers; hazardous materials and waste shall be removed from on-site storage and management areas, and the areas shall be surveyed for contamination and remediated as necessary.

## Health and Safety (PEIS Section 5.13.4):

HS-1. All site characterization, construction, operation, and decommissioning activities must be conducted in compliance with applicable Federal and State occupational safety and health standards (e.g., the Occupational Safety and Health Administration's [OSHA's] Occupational Safety and Health Standards, 29 CFR Parts 1910 and 1926, respectively).

HS-2. Conduct a safety assessment to describe potential safety issues and the means that would be taken to mitigate them, covering issues such as site access, construction, safe work practices, security, heavy equipment transportation, traffic management, emergency procedures, and fire control.

HS-3. Develop a health and safety program to protect workers during site characterization, construction, operation, and decommissioning of a wind energy project. The program shall identify all applicable Federal and State occupational safety standards and establish safe work practices addressing all hazards, including requirements for developing the following plans: general injury prevention; PPE requirements and training; respiratory protection; hearing conservation; electrical safety; hazardous materials safety and communication; housekeeping and material handling; confined space entry; hand and portable power tool use; gas-filled

equipment use; and rescue response and emergency medical support, including on-site first-aid capability.

HS-4. As needed, the health and safety program must address OSHA standard practices for the safe use of explosives and blasting agents (if needed for site development); measures for reducing occupational EMF exposures; the establishment of fire safety evacuation procedures; and required safety performance standards (e.g., electrical system standards and lighting protection standards). The program shall include training requirements for applicable tasks for workers and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies shall be established.

HS-5. Design all electrical systems to meet all applicable safety standards (e.g., the National Electrical Safety Code) and comply with the interconnection requirements of the transmission system operator.

HS-6. In the event of an accidental release of hazardous substances to the environment, document the event, including a root cause analysis, a description of appropriate corrective actions taken, and a characterization of the resulting environmental or health and safety impacts. Documentation of the event shall be provided to permitting agencies and other appropriate Federal and State agencies within 30 days, as required.

HS-7. Develop a project health and safety program that addresses protection of public health and safety during site characterization, construction, operation, maintenance, and decommissioning activities for a wind energy project. The program shall establish a safety zone or setback for wind energy facilities and associated transmission lines from residences and occupied buildings, roads, ROWs, and other public access areas that is sufficient to prevent accidents resulting from various hazards during all phases of development. It shall identify requirements for temporary fencing around staging areas, storage yards, and excavations during construction or decommissioning activities. It shall also identify measures to be taken during the operations phase to limit public access to facilities (e.g., equipment with access doors shall be locked to limit public access, and permanent fencing with slats shall be installed around electrical substations).

HS-8. Develop a traffic management plan for the site access roads to control hazards that could result from increased truck traffic (most likely during construction or decommissioning), ensuring that traffic flow would not be adversely affected and that specific issues of concern (e.g., the locations of school bus routes and stops) are identified and addressed. This plan shall incorporate measures such as informational signs, flaggers (when equipment may result

in blocked throughways), and traffic cones to identify any necessary changes in temporary lane configurations. The plan shall be developed in coordination with local planning authorities.

HS-9. Use proper signage and/or engineered barriers (e.g., fencing) to limit access to electrically energized equipment and conductors in order to prevent access to electrical hazards by unauthorized individuals or wildlife.

HS-10. Site and design the project to comply with FAA regulations, including lighting requirements, and to avoid potential safety issues associated with proximity to airports, military bases or training areas, or landing strips.

HS-11. Develop a fire management and protection plan to implement measures to minimize the potential for a human-caused fire and to respond to human- caused or natural-caused fires.

HS-12. Project developers shall work with appropriate agencies (e.g., DOE and TSA) to address critical infrastructure and key resource vulnerabilities at wind energy facilities, and to minimize and plan for potential risks from natural events, sabotage, and terrorism.

# APPENDIX E - WILLOW CREEK PROJECT DISTURBANCE AREA

## *TEMPORARY DISTURBANCE*

| | Number/length of facility | Temporary disturbance area (or width for linear facilities) | Temporary disturbance area (acres) | Assumption / basis for calculation |
|---|---|---|---|---|
| Turbines | 45 | 262 feet x 262 feet | 71 | 262-foot by 262-foot construction disturbance area per turbine |
| Collector lines | 139,646 feet | 10 feet | 11 | 10-foot wide feeder trenching; some is shared with road disturbance |
| O&M facility | 1 | 11,500 square feet | 0.3 | 11,500 square foot construction disturbance area for O&M building and parking |
| Access roads | 137,247 feet | 66 feet | 207 | 66-foot construction disturbance width |
| Willow Creek Substation | 1 | 69,000 square feet | 2 | 69,000 square foot construction disturbance area for substation |
| Met towers | 4 | 420 square feet | 0.04 | Four temporary towers; 420 square foot disturbance footprint for each tower |
| Laydown/stockpile/batchplant | 1 | 1,742,400 square feet | 40 | One 40-acre yard required for Project Area |
| Crane walks | 137,247 feet | 20 feet | 0 | Assume within road disturbance |
| ***TOTAL TEMPORARY DISTURBANCE AREA (acres)*** | | | ***331*** | |

## *PERMANENT DISTURBANCE*

| | Number/length of facility | Permanent disturbance area (or width for linear facilities) | Permanent disturbance area (acres) | Assumption / basis for calculation |
|---|---|---|---|---|
| Turbines | 45 | 66 feet x 66 feet | 4 | 66-foot by 66-foot permanent disturbance area per turbine |
| Collector lines | 139,646 feet | 0 | 0 | Feeder trenching will be reseeded and there will be no permanent disturbance |
| O&M facility | 1 | 10,000 square feet | 0.2 | Includes O&M building and parking |
| Access roads | 137,247 feet | 33 feet | 103 | Estimated average road width of 33 feet |
| Willow Creek Substation | 1 | 60,000 square feet | 1 | 300-foot by 200-foot substation footprint |
| Met towers | 2 | 420 square feet | 0.02 | Two permanent towers; 420 square foot disturbance footprint for each tower |
| ***TOTAL PERMANENT DISTURBANCE AREA (acres)*** | | | **109** | |

# APPENDIX F - CONSISTENCY EVALUATION FORMS

***Programmatic Biological Assessment Project Consistency Evaluation Form****
***Upper Great Plains Region Wind Energy Development Program***

| *(for USFWS Internal Use Only)* | *TAILS S7 Bundle #:* | |
|---|---|---|
| | *Individual TAILS Log #:* | |

## Project Proponent

| | | | |
|---|---|---|---|
| Project Name: | Willow Creek Wind Power Project | Developer: | Wind Quarry Operations, LLC |
| State: | South Dakota | City: | Montrose |
| County: | Butte | State: | Colorado |
| Township, Range & Sections: | See Exhibit A attached | POC: | Patrick O'Meara - CEO |
| | | Phone: | 970-417-0878 |

## Federal Agency/Point of Contact

| Fish & Wildlife Service Ecological Services Field Office | | Western Area Power Administration | |
|---|---|---|---|
| City: | Pierre | City: | Billings |
| State: | South Dakota | State: | Montana |
| POC: | Natalie Gates | POC: | Lou Hanebury |
| Phone: | 605-224-8693 Ext. 227 | Phone: | 406-255-2812 |

For actions involving USFWS Land interests:

USFWS Wetland Management District:

City: State:

POC:

Phone:

| | Y | N |
|---|---|---|
| USFWS Property Interest | ☐ | ☒ |
| Grassland Easement Exchange | ☐ | ☒ |

## Project Description Overview with Best Estimates

| | | | | | |
|---|---|---|---|---|---|
| Construction Initiation Date: | 10/01/2016 | Max. Turbine Ht: | 440 feet | Project Area Size: | 23,500 acres |
| Construction Completion Date: | 12/31/2017 | Turbine Pad Size: | 20' x 20' | Wind Reserve Area Size: | |
| Number Turbines: | 45 | Miles (km) of New Road: | 26 miles | Power Generating Initiation Date: | 12/01/2017 |
| Turbine Tower Height (ft/m): | 80 meters | Miles (km) Improved Road: | 0 | Project Termination Date: | 12/31/2057 |
| Turbine RSA: | 9,144 Sq.Meters | Miles (km) Existing County Rd: | 14 miles | | |
| Turbine Size (MW), Make & Model: | 2.3 MW Siemens SWT2.3-108 | | | | |

Collector Lines from Turbine to Substation: Miles Buried: 26 miles Miles Overhead: 0.1

To help demonstrate compliance with the BMPs, Species Specific Avoidance and Minimization Measures, a complete application must include maps of the project area and associated species/habitat/buffer zones. Maps attached Yes* ☒ No ☐ (*see BBCS)

## Land Cover Types Affected

| | Yes | No | Acres: Private | State | Federal | Subtotal | % Total | Description/Comments |
|---|---|---|---|---|---|---|---|---|
| Native Grass | ☒ | ☐ | 17,352 acres | | | | 73.8% | Low diversity (species and structural) western wheatgrass with some areas of blue grama. Bare ground can exceed 15%. Under certain seasonal conditions, yellow sweetclover can become dominant changing the vertical structure and biomass substantially, thereby providing habitat for a different community of grassland birds. |
| Tame Grass | ☒ | ☐ | *5800 acres* | | | | 24.7% | Mixed species assemblages of intermediate wheatgrass, alfalfa, quackgrass, smooth brome, and some native component. Hayed but not necessarily each year. |
| Agricultural | ☒ | ☐ | | | | | | Alfalfa dominated and codominated stands hayed. Included in "Tame Grass" |
| Wetland | ☒ | ☐ | *348 acres* | | | | 0.015% | Ephemeral wetlands comprising foxtail barley and curly dock providing poor wildlife habitat. 121 wetlands identified in NWI; 3 permanent with the vast majority seasonally or temporarily flooded. |
| Riparian | ☐ | ☒ | *0* | | | | | Small, narrow bands of sedges bordering ephemeral streams. |
| Trees | ☐ | ☒ | *0* | | | | | Only decadent shelterbelt of nonnative species present. |
| Other | ☐ | ☒ | | | | | | |
| Total | | | *23500* | | | | 100% | |

***Programmatic Biological Assessment Project Consistency Evaluation Form****
***Upper Great Plains Region Wind Energy Development Program***

**ESA Listed (L), Proposed (P) and Candidate (C) Species Affected (Check Boxes)**

| Plants | Invertebrates | Fish | Reptiles | Birds | Mammals |
|---|---|---|---|---|---|
| ☐ EP Fringed Orchid (L) | ☐ American Burying Beetle (L) | ☐ Bull Trout (L) | ☐ Eastern Massasauga (C) | ☐ G. Sage Grouse (C) | ☐ Black-footed Ferret (L) |
| ☐ Mead's Milkweed (L) | ☐ Dakota Skipper (L) | ☐ Pallid Sturgeon (L) | | ☐ Int. Least Tern (L) | ☐ Canada Lynx (L) |
| ☐ Prairie Bush Clover (L) | ☐ Higgins Eye (L) | ☐ Topeka Shiner (L) | | ☐ Piping Plover (L) | ☐ Gray Wolf (L) |
| ☐ Ute Ladies'-Tresses (L) | ☐ Poweshiek Skipperling (L) | | | ☐ Rufa Red Knot (L) | ☐ Grizzly Bear (L) |
| ☐ WP Fringed Orchid (L) | ☐ Salt Creek Tiger Beetle (L) | | | ☐ Sprague's Pipit (C) | ☐ Indiana Bat (L) |
| ☐ Whitebark Pine (C) | ☐ Scaleshell Mussel (L) | | | ☒ Whooping Crane (L) | ☒ N. Long-Eared Bat (L) |

☒ **Project proponent has reviewed the Programmatic Wind Energy EIS and BA, Appendix B of the BA relating to Species Consistency Evaluation Forms, and the U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines.**

**Commitment to incorporate applicable BMPs and Species-Specific Avoidance & Minimization Measures into the project plan:**

| Patrick D. O'Meara, DO | | |
|---|---|---|
| Project Proponent (Point of Contact) | Signature | Date |

**Agency Verification of Compliance with the Programmatic Wind Energy Biological Assessment:**

| Lou Hanebury | | |
|---|---|---|
| Western Area Power Administration (Point of Contact) | Signature | Date |
| N/A | | |
| U.S. Fish & Wildlife Service (Point of Contact) | Signature | Date |
| Natalie Gates | | |
| U.S. Fish & Wildlife Service (ES Field Office Lead Biologist) | Signature | Date |

***Version 3: March 2015**

***Programmatic Biological Assessment Species Consistency Evaluation Form***
***Upper Great Plains Region Wind Energy Development Program***
**Impact Information and Consistency Determination**

**Whooping crane *(Grus americana)***

Project Name: Willow Creek Wind Power Project

Company: Wind Quarry Operations, LLC

## Best Management Practices

☒ All general BMPs, as stated in the final *Programmatic Environmental Impact Statement for the Upper Great Plains Region Wind Energy Program* and table 4.5-1 of the final *Programmatic Biological Assessment for the Upper Great Plains Region Wind Energy Program,* will be implemented where appropriate, during each phase of the project (i.e., site characterization, construction, operations, and decommissioning). Although not all-inclusive, several of the more important BMPs for the conservation of this species follow.

☒ The use of guy wires on meteorological towers shall be avoided or minimized. Any needed guy wires shall have guys appropriately marked with approved bird flight diverters.

## Species-Specific Avoidance Measures

For projects that occur within the portion of the whooping crane migration corridor that encompasses 95 percent of historic sightings:

☒ Conduct preconstruction evaluations and/or surveys to identify wetlands that provide potentially suitable stopover habitat and areas of occurrence within project boundaries.

☒ Do not site turbines, transmission lines, access roads, or other project facilities within 1 mi (1.6 km) of wetlands that provide suitable stopover habitat or within 5 mi (8 km) of the Platte or Niobrara Rivers in Nebraska.

☒ Do not site turbines, transmission lines, access roads, or other project facilities within 5 mi (8 km) of designated critical habitat.

## Species-Specific Minimization Measures

For projects that that occur within the portion of the whooping crane migration corridor that encompasses 95 percent of historic sightings:

☒ Place approved bird flight diverters on the top static wire on any new or upgraded overhead collector, distribution, and transmission lines within 1 mi (1.6 km) of suitable stopover habitat.

☐ Establish a procedure for preventing whooping crane collisions with turbines during operations by establishing and implementing formal plans for monitoring the project site and surrounding area for whooping cranes during spring and fall migration periods throughout the operational life of the project (or as determined by the local USFWS field office) and shutting down turbines and/or construction activities within 2 mi (3.2 km) of whooping crane sightings. Monitoring can be done by existing onsite personnel trained in whooping crane identification. Specific requirements of the monitoring and shutdown plan will be determined during preconstruction evaluations. Sightings of whooping cranes in the vicinity of projects will be reported to the appropriate USFWS field office immediately.

☒ Instruct workers in the identification and reporting of sandhill and whooping cranes and to avoid disturbance of cranes present near project areas.

☐ The acreage of wetlands that are potentially suitable migratory stopover habitat located within a 0.5 mi (0.8 km) radius of turbines may be mitigated based upon site-specific evaluations.

***Programmatic Biological Assessment Species Consistency Evaluation Form***
***Upper Great Plains Region Wind Energy Development Program***
**Impact Information and Consistency Determination**

## Whooping crane *(Grus americana)*

| Impact Information | | | |
|---|---|---|---|
| Project within county with recorded whooping crane? | ☒ Yes | ☐ No | |
| Preconstruction evaluations conducted with USFWS? | ☒ Yes | ☐ No | Dates: 9 July 2015 |
| Parties involved: | Natalie Gates, USFWS | | |
| Suitable habitat in or near project footprint? | ☒ Yes | ☐ No | |
| Distance from suitable stopover habitat: | Within project | Miles | |
| Distance from designated critical habitat? | 333 | Miles | |
| Distance from the Platte or Niobrara River? | 333 | Miles | |
| New overhead distribution/transmission lines proposed? | ☒ Yes | ☐ No | |
| Distance from suitable stopover habitat? | Within project | Miles | |
| Marking with approved bird flight diverters proposed? | ☒ Yes | ☐ No | |
| Monitoring plan for spring/fall migration (copy attached)? | ☐ Yes | ☒ No | |
| Employees trained in identification of whooping cranes? | ☒ Yes | ☐ No | |
| Shut-down protocol for sitings within 2 mi (3.2 km) (attached)? | ☐ Yes | ☒ No | |
| Map of project footprint and species habitat attached? | ☒ Yes* | ☐ No | (*see BBCS) |

**Effects—** Little suitable stopover habitat is present in the Project Area, however, it has been noted that Whooping Cranes show very opportunistic use of small wetlands and agricultural lands during migration (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2005). Approximately 68 livestock water impoundments exist within the project (one of which maintains permanent water content), but each of these provides little foraging habitat appropriate to Whooping Cranes (Urbanek and Lewis 2015). Overall, only three wetlands (of the 121 identified within the Project Area) contain permanent water and are therefore likely of little value to autumnally migrating Whooping Cranes (Table A-10). Water bodies in the Project Buffer-Final are generally impoundments nestled within drainages providing little visibility, with two notable exceptions. These ponds are impoundments of Double R Creek and sit approximately 5 km (3.25 miles) north of the Project. This said, the Project Area lies outside of the ninety-five percent Whooping Crane migration corridor (U. S. Fish and Wildlife Service 2009, Western Area Power Administration 2015c). Hence, it is predicted that the project will have no impact on Whooping Cranes due to the lack of habitat and due to the bulk of Whooping Crane migration occurring further east (Tacha et al. 2010, Urbanek and Lewis 2015).

***Programmatic Biological Assessment Species Consistency Evaluation Form***
***Upper Great Plains Region Wind Energy Development Program***
**Impact Information and Consistency Determination**

**Northern long-eared bat *(Myotis septentrionalis)***

Project Name: Willow Creek Wind Power Project

Company: Wind Quarry Operations, LLC

## Best Management Practices

☒ All general BMPs, as stated in the final *Programmatic Environmental Impact Statement for the Upper Great Plains Region Wind Energy Program* and table 4.5-1 of the final *Programmatic Biological Assessment for the Upper Great Plains Region Wind Energy Program,* will be implemented where appropriate, during each phase of the project (i.e., site characterization, construction, operations, and decommissioning). Although not all-inclusive, several of the more important BMPs for the conservation of this species follow.

☒ Activities with continuous periods (i.e., longer than 24 hours) of noise disturbances greater than 75 db measured on the A scale (e.g., loud machinery) should be avoided within a 1-mi (1.6-km) radius of known or assumed northern long-eared bat hibernacula..

☒ Restrict use of herbicides for vegetation management near known or assumed northern long-eared bat hibernacula to those specifically approved for use in karst (e.g., sinkholes) and water (e.g., streams, ponds, lakes, wetlands).

☒ Avoid clearing of suitable habitat (spring staging, fall swarming, summer roosting) within a 5-mile (8.0 km) radius of known or assumed northern long-eared bat hibernacula. Retain snags, dead/dying trees, and trees with exfoliating (loose) bark ≥3-in. (7.6-cm) diameter at breast height (dbh) in areas ≤1 mi (1.6 km) from water.

☒ Develop and implement a Bird and Bat Conservation Strategy (BBCS) as described in the *Land-Based Wind Energy Guidelines* that includes survey protocols acceptable to the USFWS in the project area during the spring and fall bird and bat migration seasons. Mortality monitoring will help to identify individual turbines that contribute to avian and bat mortality. This information could be used to provide design layout information for future wind development projects and to reduce the potential for future avian and bat mortality.

## Species-Specific Avoidance Measures

☒ Throughout the range of the northern long-eared bat within the UGP Region, conduct preconstruction evaluations and/or surveys to identify suitable foraging, roosting, and commuting habitat within project boundaries and to identify the distance from project boundaries to hibernacula known/presumed used by northern long-eared bats. Disturbance of hibernacula is prohibited throughout the year.

☒ Avoid all suitable habitat (do not site turbines) in areas within 5 mi (8 km) of hibernacula used by northern long-eared bats or within 0.5 mi (0.8 km) of known or presumed occupied foraging, roosting, and commuting habitat. Habitat evaluations should be coordinated with the local USFWS Ecological Services Office prior to or during turbine site planning.

## Species-Specific Minimization Measures

☒ A robust survey developed and implemented as part of the BBCS program, consistent with the Wind Energy Guidelines and approved by the USFWS during the preconstruction evaluation and survey stage, will be implemented for a minimum of 1 yr preconstruction.

☒ The need for implementation of cut-in speeds higher than manufacturers' recommendations during the fall bat migration period will be based on the following site-specific, project-by-project risk assessments by the State Ecological Services Field Office of the USFWS:

- During the preconstruction evaluation and survey stage, and based on a collision risk assessment of location of the project, proximity to potential summer habitat, distance to known occurrences, distance to known hibernacula, and suspected migration patterns, the applicant will coordinate with Western, Refuges, and the local Ecological Services Field Offices of the USFWS to determine if the risk of injury or mortality is sufficiently high to warrant higher cut-in speeds.
- In the event that preconstruction surveys indicate species occurrence or occupancy of habitat adjacent to the project area, higher turbine cut-in speeds will be required to offset the increased risk for injury or mortality. The monitoring must be rigorous enough to meet standards acceptable to the local USFWS State office.
- When warranted by either of the two aforementioned conditions for specific projects, turbine cut-in speeds will be increased to 16.4 ft/sec (5.0 m/sec) or greater from 0.5 hour before sunset to 0.5 hour after sunrise during the fall migration period (generally August 15–October 15, but consult with the USFWS for the established migration dates in each State) for northern long-eared bats in the western and central areas of the UGP Region. In the eastern fringe of the UGP Region, a minimum cut-in speed of 22.6 ft/sec (6.9 m/sec) from 0.5 hour before sunset to 0.5 hour after sunrise during the fall migration period (generally August 15–October 15, but consult with the USFWS for established migration dates in each State) for northern long-eared bats is required. Areas within the UGP Region that occur east of the western borders of Minnesota and Iowa will be used as the line of demarcation where the minimum cut-in speed of 22.6 ft/sec (6.9 m/sec) will be used. Use of feathering below the respective cut-in speed of 16.4 ft/sec (5.0 m/sec) or 22.6 ft/sec (6.9 m/sec) will also be implemented at night during the fall migration season to eliminate turbine rotation and avoid mortality of migrating northern long-eared bats. Increased cut-in speed and feathering can be suspended from 0.5 hour after sunrise to 0.5 hour before sunset.

☒ Immediately report observations of northern long-eared bat mortality to the appropriate USFWS office.

***Programmatic Biological Assessment Species Consistency Evaluation Form***
***Upper Great Plains Region Wind Energy Development Program***
**Impact Information and Consistency Determination**

**Northern long-eared bat *(Myotis septentrionalis)***

| **Impact Information** | | | | |
|---|---|---|---|---|
| Project within county with recorded northern long-eared bat? | ☒ Yes | ☐ No | | |
| Preconstruction evaluations conducted with USFWS? | ☒ Yes | ☐ No | Dates: | 9 July 2015 |
| Parties involved: | Natalie Gates, USFWS | | | |
| Suitable foraging or roosting habitat in or near project footprint? | ☐ Yes | ☒ No | | |
| Distance from suitable habitat: | 12.5 (Belle Fourche R.) | Miles | | |
| Distance from hibernacula: | 65 | Miles | | |
| Has habitat been surveyed to protocol? | ☒ Yes | ☐ No | Dates of survey: | July-Nov 2014; June-Oct 2015 |
| Result of survey: | ☐ Occupied (species detected) | | ☒ Not occupied (species not detected) | |
| Turbine cut-in speed: | 3-4 | m/sec | | |
| Map of project footprint and species habitat attached? | ☒ Yes* | | ☐ No | (*see BBCS) |

**Effects—**Explanation of consistency determination with programmatic effects determination of "may affect, not likely to adversely affect" or "no effect":

Anabat recordings were analyzed both automatically and visually inspected. Roosting and high quality foraging habitats are lacking for northern long-eared bats in the Project Area. Substantial acoustical and mist-netting surveys throughout western South Dakota over the past few years have not identified any northern long-eared bats (Bachen and Maxell 2014; Bryce Maxell 2016, pers. communication, 21 September 2016). Acoustical surveys at Shadehill Reservoir in Perkins Co. in 2012 identified northern long-eared bat calls (Kempema 2016). Other acoustical and mist netting data, mostly in counties within or adjacent to the Black Hills National Forest have documented Northern Long-eared bats (Tigner 2004, Tigner 2005, Tigner 2006). None of the reported occurrences of Northern Long-eared bats have been confirmed by DNA analysis. The nearest documented hibernaculum for this species is near Hill City in the Black Hills, approximately 105 km (65 miles) south of the Project Area. Passive acoustical surveys (Anabat) deployed at a permanent water body containing emergent vegetation (*Typha latifolia*) and peach-leaf willows (*Salix amygdaloides*) north of the Project Area failed to detect northern long-eared bat calls. Analyses of recordings for Summer 2015 are ongoing but by 9 September 2015 no northern long-eared bat calls were detected. Calls appearing to be of higher frequency were identified as non- NLEB approach calls (Bryce Maxell, Montana Natural Heritage Program). Extensive mist-netting and acoustical monitoring in Newell, SD by MNHP have not encountered any NLEB. There is little suitable habitat for NLEB in the area, with a lack of tree, rocky outcroppings, and permanent water sources. Post-construction mortality monitoring will be performed at the site.

In addition, the final NLEB 4(d) Rule stated that incidental take resulting from wind energy development and operation is not prohibited, provided that the conservation measures set forth in the 4(d) Rule are followed to protect hibernacula and known, occupied maternity nest trees. Willow Creek will implement those conservation measures.



Maxell, B. 2016. Personal communication from Maxell (Montana Natural Heritage Program, Helena, MT) to E. C. Atkinson (Marmot's Edge Conservation, Belfry, MT), September 21, 2016.

Kempema, S. 2016. Personal communication from Kempema (South Dakota Department of Game, and Fish and Parks, Pierre, SD.) to L. Hanebury (Western Area Power Administration, Billings, MT), April 6, 2016.

Tigner, J. 2004. Bat Surveys of Buffalo Gap National Grasslands. A report to SD Dept. of Game, Fish and Parks & USFS Buffalo Gap Natl. Grasslands. Batworks, Rapid City, SD. 70pp.

Tigner, J. 2005. Bat Surveys of Buffalo Gap National Grasslands. A report to SD Dept. of Game, Fish and Parks. Batworks, Rapid City, SD. 35 pp.

Tigner, J. 2007. Bat Surveys of Buffalo Gap National Grasslands. A report to SD Dept. of Game, Fish and Parks. Batworks, Rapid City, SD. 47 pp.

# APPENDIX G - SCOPING MEETING INFORMATION

**Department of Energy**
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800



JUN 17 2015

B0401.BL

Dear Customers and Interested Parties:

The Western Area Power Administration (Western), a power-marketing agency of the Department of Energy, has received a request from Wind Quarry LLC to interconnect the proposed Willow Creek Wind Project (Project) with Western's Maurine-Rapid City 115-kV Transmission Line. Western is announcing the scoping period for the Project Environmental Assessment (EA). The Project involves the potential construction of an approximate 103-MW wind farm generating facility that includes up to 45 turbines, an underground power collection system, substation, access roads, and a maintenance and operation center. The Project will be located approximately ten miles northeast of Newell in Butte County, South Dakota. The 39,000 acre wind farm site legal description includes parts of:

| County | Township | Range | Sections |
|---|---|---|---|
| Butte | 10 N | 7 E | 1-4, 10-14 |
| | 10 N | 8 E | 5, 7-8 |
| | 11 N | 7 E | 15, 19-22, 26-28, 30, 32, 35 |

The location of the Project is reflected in the enclosed figure. The proposed Project would interconnect with Western's Maurine to Rapid City 115-kV Transmission Line within the Project boundary. Western is preparing an EA in order to comply with the National Environmental Policy Act (NEPA), which requires Western to take into account the environmental impacts that could result from an action. NEPA also requires that Federal agencies seek public input on proposed projects.

The wind farm is sited on private land holdings. The land does include Conservation Reserve Program (CRP) contract lands. Wind turbines are anticipated to be installed on land with CRP contracts. The land has traditionally been used for agricultural fields and cattle grazing and, except for the contracted CRP land, will continue as grazing lands and agricultural fields.

The scoping period provides an opportunity for the public and Federal, state, local agencies, and tribal governments to identify issues or alternatives that help define the scope of the EA. The public scoping period begins on July 8, 2015, and ends on August 7, 2015. One public scoping meeting will be held to provide an opportunity for the public to submit scoping comments on the proposal in person, and talk to staff working on the Project. The scoping meeting will be held on July 8, 2015, between 5:00 p.m. and 8:00 p.m. in the Multipurpose Room at the Newell School, 501 Dartmouth Avenue, Newell, SD 57760.

Comments will be accepted at the scoping meeting, by letter to me at the above address, by phone at (406) 255-2811 or by e-mailing me at reuber@wapa.gov . Please refer to the Willow Creek Wind Project in your correspondence. Send all comments by close of business August 7, 2015.

Sincerely,

Micah K. Reuber
NEPA Coordinator

Enclosure

# 2013 BUTTE COUNTY SOUTH DAKOTA

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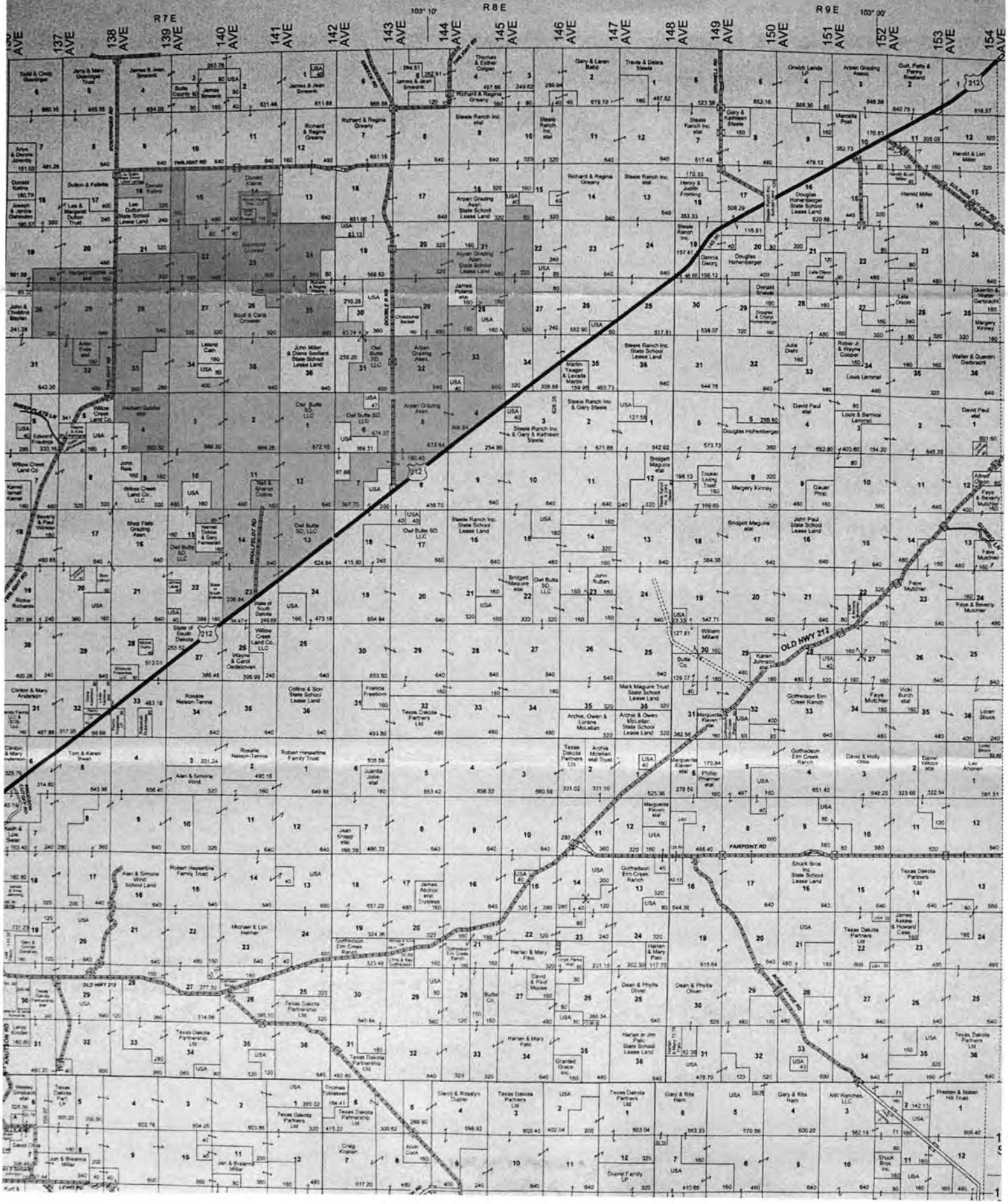

June 24, July 1 L20940249

**PUBLIC INPUT ENCOURAGED!**

Public comments are sought to define the scope and alternatives for an Environmental Assessment of a proposed wind energy facility in Butte County, approximately ten miles northeast of Newell, South Dakota. The proposed project, to be called Willow Creek Wind Project, will include up to 45 wind turbine generators, an underground power collection system, project substation, access roads, and a maintenance and operation center. Construction of the Willow Creek project is proposed to begin as early as the beginning of 2016.

Western Area Power Administration will hold a public scoping meeting to define the scope of the Willow Creek Wind Project Environmental Assessment. The meeting location is handicapped accessible.

To learn more about this project and to share your ideas, join us at:

5 to 8 pm Wednesday, July 8, 2015
Newell School Multipurpose Room
501 Dartmouth
Newell, SD 57760

For more information about the proposed project or to be added to the project mailing list, please contact:

Micah Reuber, Upper Great Plains NEPA Coordinator
Western Area Power Administration
P.O. Box 35800
Billings, MT 59107-5800
Phone: (800) 358-3415,
FAX: (406) 255-2900
Email: reuber@wapa.gov

(Published twice at the total approximate cost of $49.07).
**BUTTE COUNTY POST**

# *Affidavit of Publication*

*STATE OF SOUTH DAKOTA*

*County of Butte* *SS:*

*Mary Lee being first duly sworn, upon his/her oath says: That he/she is now and was at all time hereinafter mentioned, an employee of the Rapid City Journal, a corporation of Rapid City, South Dakota, the owner and publisher of the BUTTE COUNTY POST, a legal and daily newspaper printed and published in Belle Fourche, in said County of Butte, and has full and personal knowledge of all the facts herein stated as follows: that said newspaper is and at all of the times herein mentioned has been a legal and daily newspaper with a bonafide paid circulation of at least Two Hundred copies weekly, and has been printed and published in the English language, at and within an office maintained by the owner and publisher thereof, at Belle Fourche, in said Butte County, and has been admitted to the United States mail under the second class mailing privilege for at least one year prior to the publication herein mentioned; that the advertisement, a printed copy of which, taken from said Butte County Post, the paper in which the same was published, is attached to this sheet and made a part of this affidavit, was published in said paper once each* week *for* two *successive* weeks*, the first publication there of being on the* 24th *day of* June *that the fees charged for the publication there of are* Forty nine *dollars and* seven *cents.*

Mary Lee

*Subscribed and sworn to before me this* first *day of* July*,* 2015*.*

*Notary public*

DUSTIN RICE
SEAL NOTARY PUBLIC SOUTH DAKOTA SEAL

My Commission Expires
July 1, 2020

*My commission expires*

# Affidavit of Publication

STATE OF SOUTH DAKOTA

County of Pennington SS:

June 24, July 1
L20940251

**PUBLIC INPUT ENCOURAGED!**

Public comments are sought to define the scope and alternatives for an Environmental Assessment of a proposed wind energy facility in Butte County, approximately ten miles northeast of Newell, South Dakota. The proposed project, to be called Willow Creek Wind Project, will include up to 45 wind turbine generators, an underground power collection system, project substation, access roads, and a maintenance and operation center. Construction of the Willow Creek project is proposed to begin as early as the beginning of 2016.

Western Area Power Administration will hold a public scoping meeting to define the scope of the Willow Creek Wind Project Environmental Assessment. The meeting location is handicapped accessible.

To learn more about this project and to share your ideas, join us at:
5 to 8 pm Wednesday, July 8, 2015
Newell School Multipurpose Room
501 Dartmouth
Newell, SD 57760

For more information about the proposed project or to be added to the project mailing list, please contact:

Micah Reuber, Upper Great Plains NEPA Coordinator
Western Area Power Administration
P.O. Box 35800
Billings, MT 59107-5800
Phone: (800) 358-3415, FAX: (406) 255-2900
Email: reuber@wapa.gov

(Published twice at the total approximate cost of $75.04).

*Mary Lee being first duly sworn, upon his/her oath says: That he/she is now and was at all time hereinafter mentioned, an employee of the RAPID CITY JOURNAL, a corporation of Rapid City, South Dakota, the owner and publisher of the RAPID CITY JOURNAL, a legal and daily newspaper printed and published in Rapid City, in said County of Pennington, and has full and personal knowledge of all the facts herein stated as follows: that said newspaper is and at all of the times herein mentioned has been a legal and daily newspaper with a bonafide paid circulation of at least Two Hundred copies daily, and has been printed and published in the English language, at and within an office maintained by the owner and publisher thereof, at Rapid City, in said Pennington County, and has been admitted to the United States mail under the second class mailing privilege for at least one year prior to the publication herein mentioned; that the advertisement, a printed copy of which, taken from said Rapid City Journal, the paper in which the same was published, is attached to this sheet and made a part of this affidavit, was published in said paper once each* week *for* two *successive* weeks, *the first publication there of being on the* 24th *day of* June *that the fees charged for the publication there of are* Seventy five *dollars and* four *cents.*

Mary Lee

*Subscribed and sworn to before me this* First *day of* July, 2015.

*Notary public*

DUSTIN RICE
NOTARY PUBLIC SOUTH DAKOTA

My Commission Expires
July 1, 2020

*My commission expires*

**Radio AD:**
Western Area Power Administration invites you to attend a public scoping meeting to help define the scope of an Environmental Assessment of the Willow Creek Wind Project, a proposed wind energy project in Butte County, South Dakota. The proposed project will include up to 45 wind turbine generators, an underground power collection system, project substation, access roads, and a maintenance and operation center. Construction of the Willow Creek project is proposed to begin as early as the beginning of 2016.

The public meeting will be held Wednesday, July 8th from 5 to 8 PM at the Newell K-12 School in Newell. For more information, please call Micah Reuber at 1-800-358-3415.

# APPENDIX H - AGENCY CORRESPONDENCE AND PUBLIC COMMENTS

USDA

United States Department of Agriculture

July 6, 2015

Micah K. Reuber, NEPA Coordinator
Department of Energy, Western Area Power Administration
P.O. Box 35800
Billings, MT 59107-5800

RE: Environmental Review for:
Wind Quarry LLC interconnection of the proposed Willow Creek Wind Project with Westerns Maurine-Rapid City115-kV Transmission Line

Dear Mr. Reuber:

Thank you for the opportunity to provide Farmland Protection Policy Act (FPPA) review of this project. There are no areas of prime or important farmlands within the areas requested for review. The project as outlined will have **no effect** on prime or important farmland.

The Natural Resources Conservation Service (NRCS) would advise the applicant to consult with the local NRCS and Farm Service Agency offices regarding any United States Department of Agriculture easements or contracts in the project areas that may be affected. For any other easements outside of the NRCS, you should check with the local courthouse.

If you have any questions, please contact me at (605) 348-2889 ext. 104.

Sincerely,

TIMOTHY NORDQUIST
NRCS Conservation Agronomist

**Natural Resources Conservation Service**
414 E Stumer Road, Suite 700
Voice: 605.348.2889 ext 104 Fax: 855.256.2553

**DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

July 20, 2015

Micah Reuber
Western Area Power Administration
PO Box 35800
Billings, MT 59107-5800

Dear Mr. Reuber:

The South Dakota Department of Environment and Natural Resources (DENR) reviewed the request from Wind Quarry LLC to interconnect the proposed Willow Creek Wind Project with Western's Maurine-Rapid City 115 kV Transmission line. According to the letter dated June 17, 2015 the project will occur in Butte County, South Dakota. Based on the general information provided the DENR has the following comments:

1. The department does not anticipate any adverse impacts to drinking waters of the state. The Drinking Water Program has no objections to this project.

2. Based on the information provided, the department does not anticipate any adverse impacts to the air quality of the state. The Air Quality Program has no objections to this project.

3. At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site. Any construction activity that disturbs an area of one or more acres of land must have authorization under the General Permit for Storm Water Discharges Associated with Construction Activities. Contact the Department of Environment and Natural Resources for additional information or guidance at 1-800-SDSTORM (737-8676) or http://denr.sd.gov/des/sw/StormWaterandConstruction.aspx.

4. A Surface Water Discharge (SWD) permit may be required if any construction dewatering should occur. Please contact this office for more information.

5. Surface water bodies are considered waters of the state and are protected under the South Dakota Surface Water Quality Standards. The discharge of pollutants from any source, including indiscriminate use of fill material, may not cause destruction or impairment except where authorized under Section 404 of the Federal Water Pollution Control Act. Please contact the U.S. Army Corps of Engineers concerning this permit.

6. The Waste Management Program does not anticipate any adverse impacts. All waste material must be managed according to our solid waste requirements. Please contact the Waste Management Program if you have any questions on asbestos or solid waste disposal requirements at (605) 773-3153.

7. The South Dakota Department of Environment and Natural Resources (DENR) Ground Water Quality Program has reviewed the above-referenced project for potential impacts to ground water quality. Based on the information submitted in your letter dated June 17, 2015, DENR does not anticipate adverse impacts to ground water quality by this project.

   There have been numerous petroleum and other chemical releases throughout the state. Of the releases reported to DENR, we have identified four release cases potentially in the vicinity of your project (please see enclosed table). However, the locational information provided to us regarding releases is sometimes inaccurate or incomplete. If you would like to do more research, additional information on reported releases in South Dakota may be obtained at the following website: http://arcgis.sd.gov/server/denr/spillsviewer/.

   In the event that contamination is encountered during construction activities or is caused by construction activity, Wind Quarry LLC, or its designated representative, must report the contamination to DENR at 605-773-3296. Any contaminated soil encountered or caused by the construction activities must be temporarily stockpiled and sampled to determine disposal requirements.

If you have any questions concerning these comments, please contact me at (605) 773-3351.

Sincerely,

John Miller
Environmental Scientist
Surface Water Quality Program

cc: Erin Dreis, Drinking Water Program
Brad Schultz, Air Quality Program
Vonni Kallemeyn, Waste Management Program
Ryan Fitzpatrick, Ground Water Quality Program

# Table 1: Release Cases Near the Project Area(s) as of 06/29/15

| DENR ID | Site Name | City | County | Street | Material | Status | R1 | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 93.429 | DOD/USAF/MMII Oscar-8 | Newell | Butte | 12 mi. NE of Newell | TPH, Lead, PCB | C | MM | 44.863176 | -103.293191 |
| 95.231 | DOD/USAF/MMII Oscar-6 | Newell | Butte | 13 miles NE of Town | Diesel Fuel #2 | C | MM | 44.832753 | -103.197132 |
| 95.261 | MMII Oscar-01 | Newell | Butte | 10 miles E of Town | Petroleum | C | DR | 44.924547 | -103.236833 |
| 98.250 | Oscar-01,MM 2 MLC Facility | Newell | Butte | 17 miles NE of Newell | Gasoline | C | DR | 44.924766 | -103.237015 |

**DENR ID = DENR Case Number**

**Status: C = Closed, NFA = No Further Action, O/M = Open/Monitoring, I=Inactive**

**R1 = DENR reviewer's initials**

**DEPARTMENT OF GAME, FISH, AND PARKS**
Foss Building
523 East Capitol
Pierre, South Dakota 57501-3182

August 4, 2015

Micah Reuber
Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-58000

RE: Scoping comments for Willow Creek Wind Project

Dear Mr. Reuber,

The following is in response to your request for scoping comments on the environmental impacts from the proposed Willow Creek Wind project, an approximate 103-MW wind farm consisting of up to 45 turbines located in Butte County, South Dakota. Wind Quarry, LLC is requesting interconnection with Western's Maurine to Rapid City 115 KV transmission line. Connection with this line is the federal action triggering a National Environmental Policy Act analysis in the form of an Environmental Assessment (EA).

The following identifies habitats and species important to South Dakota's natural heritage that may be affected by the proposed wind project and should be addressed in the EA. We recommend that the EA provide up-to-date information on species and habitats in the project from recently conducted, properly timed pre-construction surveys, potential impacts to these and other known resources in the project area and ways to avoid or reduce these impacts.

**Habitat**
The location of the proposed wind farm is in an area of South Dakota which is primarily contiguous, untilled grassland. Grasslands are of high conservation value in South Dakota as many acres are being converted to cropland annually. This loss of habitat is reflected in the decline of many grassland-associated wildlife species. In addition to direct loss, grassland fragmentation occurs through the placement of turbines, power lines, roads and other infrastructure associated with a wind project that divides large tracts into smaller pieces. Several grassland wildlife species are known to be area sensitive, requiring comparatively large tracts of open, unfragmented grassland and respond negatively to tall structures. Grassland habitat is further degraded as ground

disturbance and other activities associated with construction and maintenance increases the probability of non-native and/or noxious plant encroachment. Human activity associated with wind project construction and maintenance and the increased human access to areas once isolated may decrease habitat suitability through increased wildlife disturbance. The EA should provide information on the extent of grasslands in the area, ways to avoid direct loss of grassland acres and ways to reduce degradation and fragmentation. Information on where turbines will be located should also be provided. We recommend not placing turbines in large tracts of grassland and attempt to utilize land currently in agriculture production to the maximum extent possible.

In western South Dakota, a small proportion of the land area is comprised of wetlands. In this drier western region, wetlands are particularly important to wildlife and especially so in times of drought. Information on the acres of wetlands found in the project area, wildlife use of these areas and ways these areas will be avoided should be provided in the assessment. Avoid placing turbines in wetlands or within a wetland complex.

**Species of concern**

A number of state species of concern are or are likely to be found within or near the proposed project area. Three species protected under South Dakota's threatened and endangered (TE) species law (SDCL 34A-8) are found within the area: Bald Eagle, swift fox and Peregrine Falcon (SD Administrative Rules 41:10:02:02 and 04). Bald Eagle, a state threatened species are present year round. Nesting occurs along the Belle Fourche River. This species will also use the area during both spring and fall migrations and during the winter months. Swift fox, another state threatened species, are known to breed in the general area. These animals may be the result of reintroduction efforts that have occurred in the state. Peregrine Falcon is a state endangered bird species that nests on rocky outcroppings. Nesting habitat is limited in South Dakota, but this species is a known migrant through the project area. A reintroduction effort for this species has recently taken place in Rapid City. Although the proposed project is not within the primary migration corridor for the whooping crane, a state endangered species, it may be found here either during spring or fall migration. SDCL 34A-8 does not allow for authorized take of any listed species as a result of direct take. Information on efforts to survey for and document these species as well as how take will be avoided should be included in the EA.

The South Dakota Wildlife Action Plan is a blueprint for all-species conservation with an overarching goal to keep common species common. This plan identifies over 100 species that are considered Species of Greatest Conservation Need (SGCN) in South Dakota. Note that all state TE species are also on the SGCN list. SGCN that occur or are likely to occur within the project area include Ferruginous Hawk, Burrowing Owl, Long-billed Curlew, Sprague's Pipit, Baird's Sparrow and short-horned lizards. Ferruginous Hawk, Burrowing Owl, and Long-billed Curlew are known to breed in the area. Current migration and breeding season survey information as well as ways to reduce direct and indirect impacts to these species should be addressed in the EA.

Sharp-tailed grouse are a state-managed, resident species that breeds in the project area. This species is known to be area-sensitive, requiring comparatively large tracts of open, contiguous grassland. Leks are located on hilltops or other elevated sites with minimal vegetation and may coincide with suitable areas for turbine placement. Although minimal research has been conducted on the impacts of wind energy development on this species, concern exists regarding the long-term impact the placement of turbines may have on lek attendance and persistence as well as overall reproduction. Along with sharp-tailed grouse, other grassland bird species found in this area are indicative of a healthy grassland ecosystem: Ferruginous Hawk, Burrowing Owl, Grasshopper Sparrow, Baird's Sparrow, Lark Bunting, Chestnut-collard Longspur, Bobolink, Western Meadowlark and possibly Sprague's Pipit. This grassland bird community is closely tied to the amount of grassland habitat available. The EA should provide current information on how these species use the project area both during migration and breeding as well as the ways this suite of grassland birds will be impacted and proposed mitigation measures.

Improperly sighted wind farms are known to cause significant mortality to raptors. Species known to occur in the area include Swainson's Hawk, Red-tailed Hawk, Northern Harrier, Rough-legged Hawk, Bald Eagle, Golden Eagle and Burrowing Owl. Swainson's Hawk, Ferruginous Hawk, Burrowing Owl, Bald Eagle and Golden Eagle are or have nested in the general project area. Red-tailed Hawk and Great Horned Owl likely breed in the area. Rough-legged Hawk are likely present during the winter. Recent survey information on raptor use during migration and breeding and results of nest surveys should inform the environmental analysis. The EA should address how impacts to breeding, foraging and migrating raptors will be avoided.

The black-tailed prairie dog is a keystone species, having significant and unique impacts on the grassland ecosystem. Burrows are used for shelter and places to raise young. Prairie dogs are important prey species for a variety of wildlife. In particular, colonies may concentrate foraging raptors both during the breeding season and migration. Current and site-specific information on colony acreage, distribution and wildlife use should be included in the EA. Placement of turbines in or near colonies should be avoided.

Bat species that migrate long distances, such as migratory tree-roosting bats, are commonly found killed by wind farms in the United States. Red, hoary and silver-haired bats are migratory tree-roosting species and known to occur in South Dakota. Information on potential bat habitat as well as recent survey information on bat use, especially during spring and fall should be provided in the EA. This document should also provide plans for post-construction mortality monitoring and mitigation (including potential use of increased cut-in speeds or blade feathering).

New power lines are often associated with a proposed wind power project. Power line strikes and electrocutions are a known cause of mortality to birds. Ways to reduce or mitigate the impacts of power line strikes and electrocutions should be provided in the EA including use of suggested practices and mitigation measures recommended by The Avian Protection Power line Interaction Committee (APLIC).

The diversity of grassland wildlife found in this area is an important part of South Dakota's natural heritage. There are a number of potential habitat and wildlife concerns related to the proposed siting and operation of a wind project. Of particular concern with this proposed project is the impact to large, contiguous tracts of grassland habitat.

The South Dakota Department of Game, Fish and Parks appreciates the opportunity to provide scoping comments. If you have any questions or would like to further discuss potential impacts on wildlife or their habitats related to wind projects, please contact Silka Kempema, Wildlife Biologist, at 605-773-2742 or Silka.Kempema@state.sd.us.

Sincerely,

Kelly R. Hepler
Department Secretary

Richard & Regina Greany
17012 Twilight Road
Newell, SD 57760

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Mr. Micah Reuber
Dept. of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

59107$6800
57760@5

August 6, 2015

Mr. Micah Reuber
Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 36800
Billings, MT 59170-5800

RE: Willow Creek Wind Farm Project

Dear Mr. Reuber

On behalf of all concerned property owners, I am asking you to fully understand and thoroughly assess the threat our fragile environment will be facing with respect to the proposed Willow Creek Wind Project. Like the Indians and Pioneers before me, I consider myself nothing more than a caretaker of the fertile grasslands that I have been so fortunate to own. That being said, I am saddened at the thought of our ranchland, mostly undisturbed for centuries, being permanently altered by this massive wind project. With its spider web of underground cables, maintenance roads, numerous towering wind turbines and enormous concrete foundations, the natural habitat of dozens of species that make this prairie their home will most assuredly be damaged and/or destroyed. The Willow Creek Wind project will not only disrupt the habitat of land animals, the intrusion will obviously occur in the skies as well. On numerous occasions I have witnessed countless raptors such as eagles, owls, hawks and bats forage for prey, along with the seasonal migration of ducks and geese to one of the many ponds on our property... a daily reminder of how diverse the prairie wildlife is. This beautiful and necessary display of nature's ecosystem will be lost due to the competing air space of bird vs wind turbine.

I, along with another landowner next to the proposed project, were fortunate enough to be chosen to participate in a federally funded program called the, "Conservation Stewardship Program". To receive funding we were required to address and correct the following wildlife habitat issues on our property.

**ANM57**-Removal of all threats to sensitive wildlife species on the operation

**ANM58**-Reduction of attractants to human-subsidized predators in sensitive wildlife species habitat

**ANM59**-Grazing management to improve Sage Grouse habitat

**ANM10**-Harvest hay in a manner that allows wildlife to flush and escape nesting/fawning. Minimum mowing height is six inches. *Wildlife Friendly Haying is required for this enhancement.

**ANM11**-Patch-burning to enhance wildlife habitat

**ANM12**-Shallow water habitat.

**ANM21**-Prairie restoration for grazing and wildlife habitat

**ANM23**-Multi-species native perennials for biomass/wildlife habitat

Species of Greatest Conservation Need from the (SD) State Wildlife Action Plan is below.

- Grassland birds of prey: Northern goshwak, ferruginous hawk, and burrowing owl.
- Grassland game birds: greater sage-grouse and greater prairie-chicken.
- Grassland nesting songbirds: Sprague's pipit, lark bunting, Baird's sparrow, Le Conte's sparrow, chestnut-collared longspur, and white-winged junco.
- Other: willet, long-billed curlew, whooping crane, marbled godwit, and Wilson's phalarope

**ANM27**-Wildlife friendly fencing*Wildlife Friendly Fencing required for this enhancement. *Wildlife Management Plan required for this enhancement. Waterbirds (including shorebirds and waterfowl) are the targeted guilds.

**ANM32**-Extend existing filter strips or riparian herbaceous cover for water quality protection and wildlife habitat an existing filter strip or riparian herbaceous buffer is defined as an area located along the edge of a waterbody or watercourse that is at least 20 feet wide.

In conclusion, to give our hard earned tax dollars every opportunity to achieve a maximum return, I have complied with every environmental responsibilities listed in the program. If the Willow Creek Wind Project were to be approved, how sad and ironic that the very same taxpayer dollars that were used to protect the environment will now be used to destroy our beautiful landscape and ecosystem.

Sincerely,

Richard and Regina Greany
17012 Twilight Road
Newell, SD 57760
(605) 441-6052 – cell
(605) 791-1278 – home
rgreany@rap.midco.net

Lisa Greeny
17012 Twilight Rd
Newell, SD 57760

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Mr. Lou Hanebury
Dept of Energy
Western Area Power Admin. (WAPA)
Upper
P.O.
Billings,

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July 29, 2015

Mr. Micah Reuber
Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 36800
Billings, MT 59107-5800

RE: Willow Creek Wind Project

Dear Mr. Reuber,

I am writing in opposition to the projected Willow Creek Wind Project in Newell, South Dakota. After extensive research I have determined the most pressing issue is the disruption to our delicate ecosystem.

We all understand living organisms are placed in a category based on how they produce or consume energy. Plants being the "primary producers" of energy are eaten by animals such as insects and rabbits, or "primary consumers". Bats and hawks that eat these primary consumers are considered" second-level consumers". If a hawk catches an insect-eating bat instead of an insect or a rabbit, in that case, the hawk becomes a "third-level consumer". Finally, if the hawk is then eaten by a coyote, the coyote becomes a "top-level carnivore". For nature to stay in balance, this delicate dance needs to remain in check. So what happens when a bat that eats insects, or a hawk that eats mice disappear from the prairie due to a wind farm? Without bats by night and birds by day, the prairie will be overrun with prey such as moths, beetles, mice, and rabbits. The increased numbers in consumers (prey) will devour producers (plant), resulting in a dramatic shift to the ecosystem. Has anyone taken into consideration the neighboring rancher that due to no fault of their own, will be faced with dwindling crops and grass lands? Let's face it -- this is not just a local issue --- this is an ecosystem-wide issue.

Below is one of the latest studies released on the devastating effects of wind turbines on our bird population in the Dakotas.

Breeding Bird Distribution Affected by Wind Turbines in the Dakotas<https://www.wind-watch.org/news/2015/07/28/breeding-bird-distribution-affected-by-wind-turbines-in-the-dakotas/>

Credit: U.S. Geological Survey | Released: 7/27/2015 12:15:00 PM | Contact Information: U.S. Department of the Interior, U.S. Geological Survey Office of Communications and Publishing 12201 Sunrise Valley Dr, MS 119 Reston, VA 20192 | Jennifer LaVista Phone: 303-202-4764 | Jill Shaffer Phone: 701-253-5547 | www.usgs.gov<http://www.usgs.gov/newsroom/article.asp?ID=4278> ~~

New wind energy facilities placed in prime wildlife habitat in North and South Dakota can influence the distribution of several species of grassland birds for years after construction, including species whose populations are in serious decline.

According to a U.S. Geological Survey report<http://onlinelibrary.wiley.com/doi/10.1111/cobi.12569/abstract> recently published in the journal Conservation Biology, seven of nine bird species studied from 2003-2012, including the significantly declining grasshopper sparrow and bobolink, were displaced from suitable breeding habitat in native mixed-grass prairies after wind turbine construction. Displacement typically started one year after construction and persisted for at least two to five years.

"The Great Plains supports some of the last remaining native temperate grasslands in North America," Shaffer said. "Proper management of these valuable wildlife habitats can help maintain overall ecosystem health for the benefit of animals and people."

The USGS and NextEra Energy provided research funding. For more information about wildlife habitat research in the Great Plains, please visit the USGS Northern Prairie Wildlife Research Center website<http://www.npwrc.usgs.gov/>.

In conclusion, I find it astounding the Wind Industry claims to be Green Energy. Should we not care about the oil leaks, the chemicals, the cement, the roads, the turbine fires, and the disturbance to the ecosystem? All of this will effectively contribute to the loss of our fertile land and abundant wildlife? Wind is simply an unreliable commodity that not only increased electric rates in South Dakota by 26%, but could very well leave our state with permanent scars on our cherished landscape forever.

Worse yet, none of the developers will be around to account for the catastrophe when the tax "Wind Fall" is over...

Your efforts would be greatly appreciated if you could share my concerns with your constituents.

Sincerely,

Lisa Greany

Lisa Greany

cc. Lou Hanebury

## Reuber, Micah

**From:** Bill Hennessy <whennessy56@gmail.com>
**Sent:** Thursday, July 30, 2015 9:30 PM
**To:** Reuber, Micah
**Subject:** Willow creek wind project

As a resident of Meade county and a landowner in Butte county I am totally opposed to the Willow Creek Wind Farm. These eyesores never return the energy it takes to build and install them and are a horrible waste of tax dollars from an already bankrupt country.

William C Hennessy
6009 Eastside Dr Blackhawk SD 57718
605 515 0663

## Bell, Jennifer

**From:** Marsh, Matthew <MMarsh@WAPA.GOV>
**Sent:** Thursday, March 17, 2016 9:17 AM
**To:** Nancy Hilding
**Cc:** Bell, Jennifer
**Subject:** RE: Willow Creek Wind Project, Newell SD, late scoping letter

Hi Ms. Hilding,
Thank you for your comments. I will pass them on to our consultant who is pulling together the information for the Environmental Assessment (EA). We are hoping the draft EA will be released later this spring or early summer. We will share the weblink with you for the Draft EA and if any of your comments aren't covered in the draft EA, we will consider them comments to the draft EA and develop responses to those comments. As of now, we don't have any more wind projects in Western SD that have requested to interconnect to our system. Please feel free to email or call me any time.
Sincerely,
Matt

**Matt Marsh | Environmental Manager**
Western Area Power Administration | Upper Great Plains Region
(O) 406.255.2810 | (M) 406.697.9824 | mmarsh@wapa.gov

---

**From:** Nancy Hilding [mailto:nhilshat@rapidnet.com]
**Sent:** Wednesday, March 16, 2016 8:39 PM
**To:** Marsh, Matthew
**Subject:** Fwd: Willow Creek Wind Project, Newell SD, late scoping letter

I forward to you as Mr. Reuber is sick.

Begin forwarded message:

**From:** Nancy Hilding <nhilshat@rapidnet.com>
**Subject: Willow Creek Wind Project, Newell SD, late scoping letter**
**Date:** March 16, 2016 at 8:22:13 PM MDT
**To:** reuber@wapa.gov

Nancy Hilding
President
Prairie Hills Audubon Society
P.O. Box 788, Black Hawk, SD 57718
nhilshat@rapidnet.com
605-787-6779, 605-787-6466
March 16th, 2016

Micah K. Reuber
Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800
(406) 255-2811

reuber@wapa.gov

Dear Mr. Reuber,

Late scoping letter - Willow Creek Wind Project, Newell SD

Please add us to the NEPA mailing list for Willow Creek Wind Project & associated transmission lines. Sorry we were not aware of the project in a timely manner and missed
the scoping deadline and public meeting.

Our issues of concern:

We care about impacts to wildlife , especially rare or threatened/endangered wildlife. Our use of the word "wildlife" as used here, is meant to include birds and bats, who are likely at risk and for whom the most aggressive review & mitigation is needed.
We care about impacts to rare plants & rare native plant communities. We care about disturbance to any not plowed native grassland.
We care about impacts to riparian areas. We care about impacts to visual quality & sound impacts. Please identify if any part of project areas has a relatively low density
of roads or relatively low density of other evidence of humans in project area -- i.e how "wild" is the area? Please discuss any increase in disturbance to wildlife.

Please discuss impacts to neighbors.

For transmission lines - you need a discussion of the debate over the health effects of ELF radiation & visual quality impacts & impacts to
raptors & any prey the raptors eat. If lines going near/over sage brush habitat, you need discussion of impacts to sage grouse. If lines going over prairie dog
habitat -- please talk about effects to prairie dogs & burrowing owls.

Please discuss effects to Native American heritage values or to their special historical/cultural sites.

Please also discuss global warming/climate change & impacts/relief to that issue.

Thanks,

Nancy Hilding,

PS - please add us to mailing list for other wind projects in Western SD. Notification by e-mail is fine (save postage).

==========

Nancy Hilding
6300 West Elm, Black Hawk, SD 57718
or
Prairie Hills Audubon Society
P.O. Box 788, Black Hawk, SD 57718
nhilshat@rapidnet.com
605-787-6779, 605-787-6466
www.phas-wsd.org
Skype phone -787-1248, nancy.hilding

==========

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Mr Micah Rember
Upper Great Plains Customer Service Office
P.O. Box 35800
Billings, MT 59107-5800

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Western
AREA POWER
ADMINISTRATION

# Willow Creek Wind Energy Facility Open House
## July 08, 2015, 5-8 PM Newell Public School Multipurpose Room
## Newell, South Dakota
### Public Comment Meeting
### Environmental Assessment (EA)

Thank you for your interest in the proposed Willow Creek Wind Energy Facility EA. Please complete the appropriate sections of this form to be included on the EA mailing list and/or to provide comments. Written comments can be submitted at the scoping meeting, faxed to (406) 255-2900, mailed to Mr. Micah Reuber, Western Area Power Administration, Upper Great Plains Customer Service Office, and P.O. Box 35800, Billings, MT 59107-5800 or sent to **reuber@wapa.gov.** To be included in our public comment process, please ensure your comments are postmarked or turned in by **August 10, 2015.**

☐ I would like a paper copy of the Draft EA when it becomes available.
☐ I would like a Compact Disk (CD) of the EA when it becomes available.
☒ Just email me the web link to the EA when it becomes available. (Quickest and Preferred method)

***Please Print Contact Info Below***

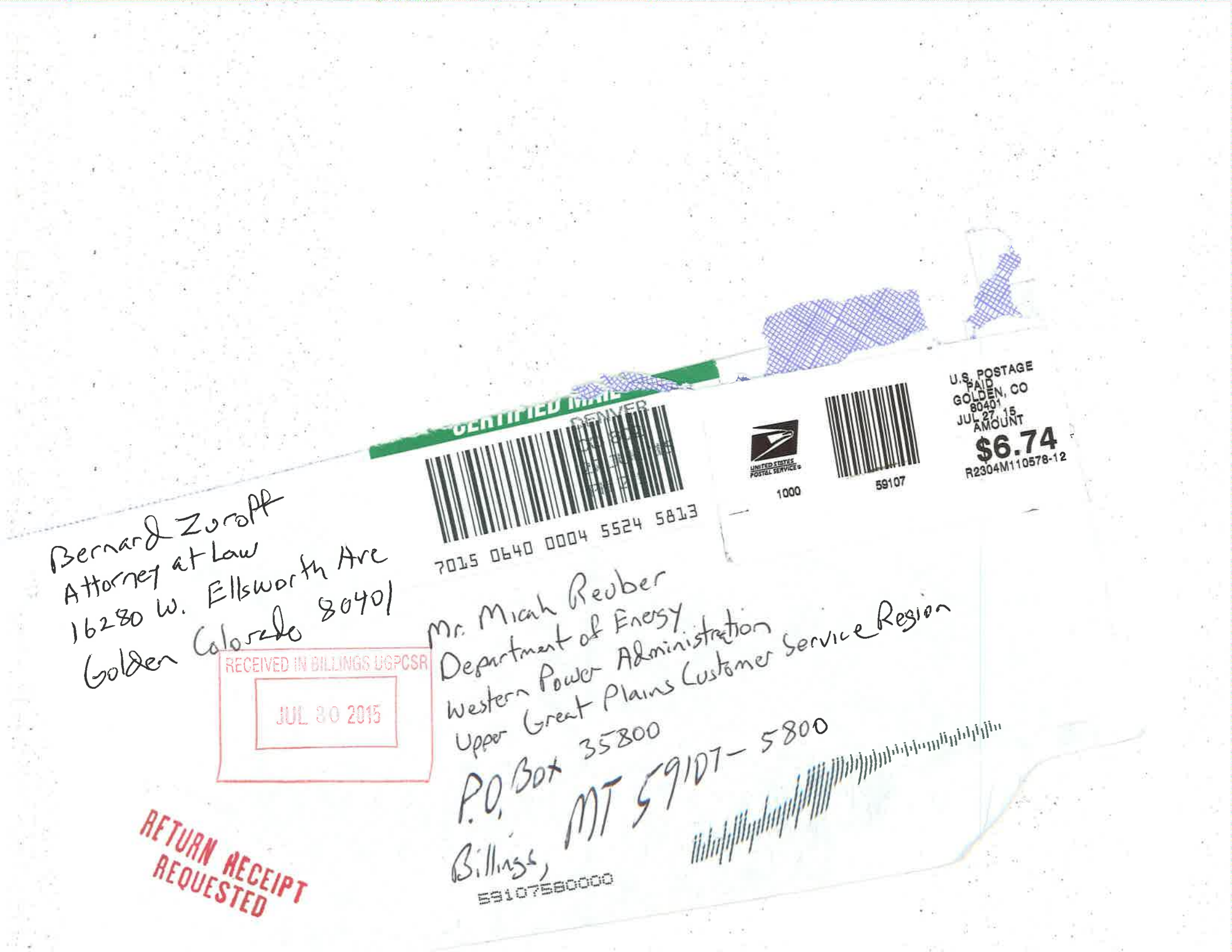
| | |
|---|---|
| Name: Diana Scollard | Organization: Owl Butte SD |
| E-mail address: animaldoc@montana.net | Daytime Phone No. *(optional):* 406 328-4131 |
| Street Address: Box 323 Absarokee, MT 59001 | City / State / Zip Code: Absarokee, MT 59001 |

Please indicate any questions, comments or concerns you have about the proposed project in the comment section below (continue on separate sheet if necessary).

wind is a clean sustainable energy resource. We are happy as a family to be part of this process. We expect minimal damage to our property that will give us extra income to make valuable improvents to the land --
This will bring tax dollars and jobs to Newell. It would be nice to be thinking about ways to increase ability to take more energy thru the power grid. I believe the way the global warming debate is going the need for wind energy will only grow -

Diana Scollard

**Thank you for your time and interest.**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Bernard Zuroff
Attorney at Law
16280 W. Ellsworth Ave
Golden Colorado 80401
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JUL 30 2015
Mr. Micah Reuber
Department of Energy
Western Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800
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RETURN RECEIPT
REQUESTED

Bernard L. Zuroff
Attorney at Law
16280 West Ellsworth Avenue
Golden, Colorado 80401
(303)949-7245
FAX (303)278-4344

July 27, 2015

Certfied Mail, Return Receipt Requested

Mr. Micah Reuber
Department of Energy
Western Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

Re: Willow Creek Wind Project

Dear Mr. Rueber,

Thank you for speaking with me the other day regarding the above referenced project. As you may remember, I am representing Mr. Richard Greany and his wife Mrs. Regina Greany . They own a ranch in close proximity to the Willow Creek Wind Project (the"Project"). The Greany's are very concerned about how this project will affect their property and their lives. They are in the process of preparing a letter to you outlining these grave concerns.

In reviewing your correspondence dated June 17, 2015 wherein you outline the "scoping" timeline with regard to the Project, it appears that the initial scoping meeting was to be held on July 8, 2015. We do not believe this provided adequate notice of the meeting or enough time to make sure all interested parties received the notice or had an opportunity to attend. It simply did not afford all sufficient time to arrange their schedules and prepare for the meeting. Many people were traveling or had other commitments. The Greany's too had issues with this very short timeframe.

Moreover, the Greany's have not received any information or explanation of what occurred at this meeting or even if it was actually held on July 8, 2015 at the designated location. As a result, they are put to a severe disadvantage with regard to the scoping process. They do not know what was said or how the Project was presented.

The Greany's hereby request that a new scoping meeting be scheduled and held and that the period for comments be restarted subsequent to the new meeting. This

would be fair to the effected parties and help to avoid any appearance that the Department of Energy was attempting to "railroad" the Project's approval through without affording proper due process.

Thank you for your consideration. Please feel free to call me if you have any questions.

Respectfully,

Bernard Zuroff

Bernard Zuroff
16280 W. Ellsworth Ave.
Golden, Colorado 80401


RAPID CITY SD
AUG 06 2015
USPS

Mr. Lou Hanebury
Department of Enosy
WAPA
P.O. Box 36800
Billings, Montana

80401@6543

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August 4, 2015

Mr. Micah Reuber
Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 36800
Billings, Montana 59107-5800

Re: Willow Creek Wind Farm Project

Dear Mr. Reuber:

I am writing this letter to express my opposition to the Willow Creek Wind Farm Project (the "Project"). My father-in-law is Richard Greany . He owns a ranch in immediate proximity to the Project. He and his wife Regina have been there for fifteen years and they are excellent stewards of the land. They were offered a chance to participate in the Project and they were told that as many as five of the wind mills would be located on their property. They turned down this potentially lucrative offer out of concern for the land.

Many people might assume that the Greany's made this decision foolishly or without careful thought. Many would be wrong. On the contrary, they have put a great deal of thought into their decision. They recognize and appreciate the benefits of this project including the potential income to their neighbors and friends. (I would strongly question the true economic benefit to these people but that is a debate for another day.) After spending a good deal of time on the ranch and in this area, I fully agree with the Greany's decision.

The land surrounding the Project's current proposed location is some of the last unspoiled grassland in South Dakota and possibly the entire United States. I rode along with Dick Greany yesterday as he toured the ranch to check on things. In the two hours or so we spent there I counted nine birds of prey. Seven were various kinds of hawks. Two were undoubtedly golden eagles, unmistakable by their dark brown coloring and majestic size. These helpless animals are now in danger from the Project.

There are eleven small lakes or ponds on the ranch. They all had water fowl . I suspect that these same ponds are popular stopping place for these species of birds as they migrate through this otherwise semi-arid area each year. All of these birds are in danger. I am sure there are many other animals that are at risk should this wind farm be approved.

There are other concerns with this project. The land itself is at risk. Standing on the Project's proposed site you can look in any direction. You will see miles of beautiful rolling grassland, dotted with the occasional ranch structure. But otherwise unspoiled. It is a special kind of beauty. One that is rapidly disappearing in the west as wind farms seemingly sprout up everywhere.

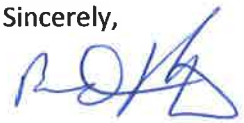
We understand the need for multiple power sources, but that surely does not mean that every bird must be put at risk. It surely does not mean that every view be spoiled. It cannot mean that all of the grasslands be ruined.

We ask that you carefully consider this Project and reject it. This project can be located somewhere else. Closer to other existing windmill farms. We fear that if this project is approved, it will open the door to many other wind farms in this area. The character of the lands will be lost forever.

Thank you for your consideration in these matters. Mr. and Mrs. Greany invite you to come and visit them at the ranch and see for yourself what is at risk. Please feel free to call them at 605-441-6052 in order to arrange a time for the visit. They will accommodate your time requirements. And they look forward to meeting you and showing you the quiet beauty of this peaceful place.

You can also contact me at 303-949-7245. My email address is bzuroff@comcast.net.

Sincerely,



Bernard Zuroff

August 4, 2015

Mr. Lou Hanebury
Department of Energy
WAPA
P.O. Box 36800
Billings, MT 59107-5800

Re: Willow Creek Wind Farm Project

Dear Mr. Hanebury,

Enclosed for your review is a copy of my letter to Micah Reuber regarding the Willow Creek Wind Farm Project. Please let me know if you have any questions or if I can provide any additional information regarding this matter.

Sincerely,

Bernard Zuroff

Bernard Zuroff
16280 west Ellsworth Ave
Golden Colorado 80401

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AUG 24 2015

Mr. Micah Reuber
Department of Energy
Western Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings MT 59107-5800

59107-580000

Bernard L. Zuroff
Attorney at Law
16280 West Ellsworth Avenue
Golden, Colorado 80401
(303)949-7245
FAX (303)278-4344

August 19, 2015

Mr. Micah Reuber
Department of Energy
Western Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

Re: American Bird Conservancy - Willow Creek Wind Project

Dear Mr. Rueber,

As you may already know, the American Bird Conservancy works directly with the Federal Government with regard to wind farms and the protection of bird life, especially relating to such protected species as golden eagles. They have issued a policy statement in this regard which incudes the following:

"**Siting**: Bird-smart wind power (including wind farms and associated infrastructure) is sited to prevent harm to birds, ideally in already altered habitats such as farmland, and avoids sensitive areas. Examples of such areas may include migratory bottlenecks, wetlands, raptor concentration and key nesting areas, the edges of ridges used by migrants, key habitat or flight paths for endangered or declining species, breeding concentrations of species that avoid tall structures (such as some grouse species), and in or adjacent to Important Bird Areas. Maps with detailed data on wildlife are currently being developed by conservation groups for use by the wind industry. Pre-construction assessments should always be conducted to confirm whether a particular site presents an especially high risk to birds. Some areas are not going to be suitable for wind development."

The Willow Creek Wind project is poorly sited. It is a direct affront to the American Bird Conservancy's policy statement. This area is not "already altered". It is not farmland. Rather this area is largely unaltered. Most of this area has never been tilled or farmed. It is some of the last unaltered grassland in the United States. Its loss would be tragic. And this loss is unnecessary.

Moreover from my own experience, I can state unequivocally that this area has a very high concentration of raptor bird life.

Richard Greany once again invites you to see for yourself. We invite you to visit the ranch and spend a few hours with him there. Please call me at 303-949-7245 to arrange a time.

I look forward to hearing from you.

Sincerely,

Bernard Zuroff

Western
AREA POWER
ADMINISTRATION

# Willow Creek Wind Energy Facility Open House
## July 08, 2015, 5-8 PM Newell Public School Multipurpose Room
## Newell, South Dakota
### Public Comment Meeting
### Environmental Assessment (EA)

Thank you for your interest in the proposed Willow Creek Wind Energy Facility EA. Please complete the appropriate sections of this form to be included on the EA mailing list and/or to provide comments. Written comments can be submitted at the scoping meeting, faxed to (406) 255-2900, mailed to Mr. Micah Reuber, Western Area Power Administration, Upper Great Plains Customer Service Office, and P.O. Box 35800, Billings, MT 59107-5800 or sent to **reuber@wapa.gov.** To be included in our public comment process, please ensure your comments are postmarked or turned in by **August 10, 2015.**

- [x] I would like a paper copy of the Draft EA when it becomes available.
- [ ] I would like a Compact Disk (CD) of the EA when it becomes available.
- [ ] Just email me the web link to the EA when it becomes available. (Quickest and Preferred method)

***Please Print Contact Info Below***

| Name: | Organization: |
|---|---|
| Tom & Sandra DeYoe | |
| E-mail address: | Daytime Phone No. *(optional)*: |
| sdeyoe@sdplains.com | 605-456-2865 or 605-456-3337 |
| Street Address: | City / State / Zip Code: |
| P.O Box 82<br>12974 Hwy 212 | Newell, SD 57760 |

Please indicate any questions, comments or concerns you have about the proposed project in the comment section below (continue on separate sheet if necessary).

We are in favor of this project. Would be a real boost to the economy and it is a clean, renewable energy.

**Thank you for your time and interest.**

Western
AREA POWER
ADMINISTRATION

# Willow Creek Wind Energy Facility Open House
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☐ I would like a paper copy of the Draft EA when it becomes available.
☑ I would like a Compact Disk (CD) of the EA when it becomes available.
☑ Just email me the web link to the EA when it becomes available. (Quickest and Preferred method)

***Please Print Contact Info Below***

| Name: | Organization: |
|---|---|
| Steve Gatzke | |
| E-mail address: | Daytime Phone No. (*optional*): |
| Sgatzke1@hotmail.com | 605-484-1407 |
| Street Address: | City / State / Zip Code: |
| 18435 Twilight Rd. | Newell, SD 57760 |

Please indicate any questions, comments or concerns you have about the proposed project in the comment section below (continue on separate sheet if necessary).

**Thank you for your time and interest.**

Western
AREA POWER
ADMINISTRATION

# Willow Creek Wind Energy Facility Open House
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~~☐~~ I would like a paper copy of the Draft EA when it becomes available.
☐ I would like a Compact Disk (CD) of the EA when it becomes available.
☒ Just email me the web link to the EA when it becomes available. (Quickest and Preferred method)

***Please Print Contact Info Below***

| Name: | Organization: |
|---|---|
| TYLER TROHKIMOINEN | BUTTE County Office of Emergency Mgmt. |
| E-mail address: | Daytime Phone No. *(optional)*: |
| emergencymgmt@buttesd.org | 605-723-0900 |
| Street Address: | City / State / Zip Code: |
| 830 6th AVE | BELLE FOURCHE, SD 57717 |

Please indicate any questions, comments or concerns you have about the proposed project in the comment section below (continue on separate sheet if necessary).

* HAZMATS on project site, both during construction + operation phases

* Fire risks during construction, and mitigation/remediation efforts you make. Do you have water to extinguish fires ignited by cutting / welding? Do

* Safety - Your build site could be 30 ~~min~~ minutes from response by ambulances. Do your people have some medical training? Will you identify, establish, maintain landing zones for helicopter ambulances?

**Thank you for your time and interest.**

Wind energy [is] an illusion, is illustrated and promoted as clean and safe as expected from a huge business raking in huge sums of taxpayer funding through the government. It is gullible believing the surface story investigate, read up on some facts or live next to a wind farm and experience first hand the oil leaks, the chemicals, the cement, the cost, the never ending maintenance, the bombardment and the cruelty, and the utter uselessness of wind energy…

http://www.thecourier.com.au/story/3056797/ill-informed-opinions-build-on-wind-farm-ignorance/

## *Increase Cost for Electricity*

At the Brookings Institution and MIT, "number crunchers" find that wind farms are almost one of the most expensive forms of energy facilities. Because the wind doesn't blow all the time, especially at high-demand hours other forms of expensive energy facilities most be kept hanging around.

At least one green energy developer recognizes that these subsidies programs have a record of doing more harm than good (Patrick Jenevein, Tang Energy Group). He notes that government subsidies to wind farms have made the industry less focused on reducing costs. In turn the industry produces a product that isn't as efficient or cheap as it might be if focused less on working the political system and more on research and development.

If wind farms take over as a primary source of electric power, we will pay more for electricity.

http://trib.com/opinion/letters/eiserman-i-hate-wind-farms/article_63d0d4d9-1615-516c-93f3-5c76261ec9c6.html

Dick Greany 441-6052

# *Decrease In Property Value*

So what do most Realtors think of a property that once had an attractive view shed but now looks at wind turbines? According to our research, **an overwhelming majority of Realtors says that wind turbines negatively impact property value**. They estimate the range of impact to be **from a 10% price reduction to being completely unsellable**.

**http://www.forensic-appraisal.com/wind-turbines**

# *Case Studies*

Case Study On farm-2007•
350 acres in Erath County–top end ranch purchased for retirement homestead.
27wind turbines within 1½ mile radius•
For sale for $2,100,000.00•
Prospective buyer agreed to sales price•
Disclosure of wind turbine project to buyer•
Buyer backed out of offer•
Seller agreed to 25% discount to Buyer•
Buyer declined discounted offer•
Currently little interest in property in spite of other characteristics of property

**http://www.texas-wildlife.org/images/uploads/Impact-of%20Wind-Turbines-o**

**n-Market-Value-of-Texas-Rural-Land.pdf**

# *Wind Leases*

The most nefarious consequences from signing on with wind leases, I believe are the clauses within the contracts such as first-rights-of-refusal and postponement of mortgages. These create a very real threat in the future, over ownership of ag. land. There is also the fact that these lease agreements are often registered to the deeds of the land, making it very difficult to discharge when it comes time for the farmer to transfer ownership of the land.

Back in 2007, Windaction.org posted "What have I done?" a true story about a farmer in Northeast Fond du Lac County (Wisconsin) who agreed to lease a portion of his land for wind development. He said:

I watched stakes being driven in the fields and men using GPS monitors to place markers here and there. When the cats and graders started tearing 22 foot wide roads into my fields, the physical changes started to impact not only me and my family, but unfortunately, my dear friends and neighbors....

Other turbine hosts also complained about their fields being subdivided or multi cable trenches requiring more lands. Roads were cut in using anywhere from 1000 feet to over a ½ mile of land to connect necessary locations. We soon realized that the company places roads and trenches where they will benefit the company most, not the land owner.

The Wisconsin farmer's experience [1] is not unique.

Illinois has some of the best farming soil in the world with McLean County rated #1 for the darkest, blackest most productive soil in the world.

But after extensive land moving and excavation needed to build roads and erect the turbines, farmers tell us that the ground is never the same afterward. The fertile soil around the towers is mixed with subsurface clay and compacted resulting in lower crop yields. Depending on the lease terms, developers may compensate landowners for crop reductions but payments are often not passed on to tenant farmers who suffer the actual losses.

Since compaction is assumed to be a construction-related impact, crop-loss payments are often time-limited up to five years. However, turbine maintenance could require the massive cranes be brought back to the site making compaction an ongoing concern throughout the life of the project. And it's not limited to existing roads or turbine pads. Complaints have been reported of turbine maintenance crews crawling across fields — flattening crops and ground — for quicker access to turbines needing service.

If drainage tiles are cut or damaged during construction, you're apt to see farmers working around ponds that were previously nonexistent. Or worse, adjacent fields not under lease can flood.

**Aerial Spraying and Crop Health**

Soil compaction and drainage issues are serious concerns, but some might argue their effects are localized, and thus manageable. But that cannot be said about the impact of wind turbines on aerial spraying — a subject that gets very little exposure.

The ability to secure aerial spraying services can be curtailed in areas where turbines are standing.

The message on the Illinois Agricultural Aviation Association(IAAA) website is clear: "farmers with wind generators may lose the option of aerial application of farm protection products, seed, fertilizers, etc. on their farm ground. … ***The fact is, it is dangerous to fly within the confines of a wind generator farm.***"

As more and more towers go up, so do the risks of aerial applications. Helicopters may be recommended because they travel at slower speeds and can work in more confined spaces but they can't carry the same loads meaning more trips at higher costs. There are far fewer helicopters in the business so timely availability is a critical issue.

Some farmers try ground applicators but aircraft can cover crops faster and more efficiently than any ground rig. In cases of Asian soybean rust, farmers could experience an 80-100% yield loss if not treated within a week. Aphids or spiders mites can destroy a field within days. If infestations occur during wet years, ground equipment on wet soil will cause compaction or ruts and lead to erosion.

As more wind farms are permitted, the cumulative effect will lead to fewer and fewer fields that can be sprayed, making total crop loss a real possibility. Since crop insurance will not cover farmers in cases of insects or plant disease where damage is due to insufficient or improper application of pest or disease control measures, crop loss could lead to significant financial losses for farmers.

**Cash Renting and Wind Farming**

Illinois' landowners and the farmers who work the land are not always the same. Illinois is second only to Connecticut for the highest number of absentee landowners (58.6%) representing 64.48% of the acres. While farmers own some land, most need to cash rent or share crop additional land to make their operations viable.

Illinois' absentee landownership, in large part, is the reason for the prevalence of wind energy development in the state (over 3500 megawatts today). Most properties leased for wind development are owned by out-of-area landowners who are disconnected from the land and have turned to low-risk, high-cash land renters rather than share-crop tenant farmers, to work the soil.

Cash rent farmers offer fixed payments to landowners for use of the land, buildings and other facilities while the landowners have no real involvement in the farming operation beyond paying property taxes and liability insurance. Share-crop tenant farmers, on the other hand, enjoy longer term partnerships with their landowners. Operating decisions of the farm are shared by both landowner and tenant farmer

and each holds a vested interest in the productivity of the land since their incomes are derived from the farm's gross earnings.

It's not unusual for cash renters to come from outside the area and to have limited experience with the soil types. They may be farming thousands of acres and barely know the condition of their crops until they return in late summer and fall for the harvest. Farmers tell us that there's a striking visual difference between farms managed by local tenant farmers and those worked by outside cash renters which, over time, could impact the environmental sustainability of the land.

Tenant farmers have no rights when a wind lease is negotiated. If they complain about having to farm around the turbines, damaged drainage tiles or low crop yields due to soil compaction they risk losing their farms altogether. Competition for rentable farmland is fierce, and absentee landowners may view their tenant farmers as more trouble than they're worth, so tenants learn to be silent.

Absentee landowners see cash rents and wind leases as equal revenue opportunities.

**Conclusion**

The idea that "wind farming" is helping farmers to keep and maintain their farms is not representative of what's happening in Illinois. In fact, those Illinois farmers who have leveraged their operations conservatively tell us that they're not interested in the "wind fall" of wind farming.

Absentee landowners may be gaining financially from wind power development, but the idea that "wind farming" is a compatible agriculture use is more myth than reality in Illinois.

**https://www.masterresource.org/linowes-lisa/incompatibility-wind-crop-farming/**

# *Eminent Domain*




VI. Eminent Domain

Eminent domain, also known as condemnation, is the government's power to take private property for public purposes, with or without the owner's consent, by

paying the owner just compensation and by complying with certain procedures set forth in state or federal law. Eminent domain proceedings may involve a taking of the full use and control of one's property, or they may involve only the occupation of a limited portion of or interest in that property, such as an easement. Any farmer faced with impending eminent domain proceedings is advised to consult an attorney; however, this section provides some general information on the subject. To take land by eminent domain, a public authority must intend to use the land for a public purpose. The courts, both state and federal, have adopted abroad interpretation of"public purpose" and largely defer to the public authority's determination that the land is necessary to further its public purpose. Both the federal and state governments determine which public authorities may exercise the power of eminent domain. Generally, state legislatures give this power to all levels of local government and public service corporations, which often include electric utility companies. But each state's treatment of its eminent domain authority may differ slightly. In Minnesota, for example, "public service corporations," including electric utilities, enjoy an express delegation of the state's eminent domain power. The utilities still have to abide by the same rules as the state itself. Under the broad definition of public purpose, electric utilities in Minnesota **can use eminent domain authority to take land for new transmission lines; it is also conceivable they would assert the authority to take other property rights needed to construct a new wind energy project. The generally accepted definition of "just compensation" is the fair market value of the land. That is, what a willing buyer would pay a willing seller for the land or for the easement. In the case of eminent domain for a power line easement, for example, the fair market value might be measured by the difference in the value of the land before and after the taking, which would account for any decreased desirability of the land to a buyer because of the easement and utility lines. Damage to the rest of the landowner's property not subject to the taking is typically included in calculating the just compensation. Construction of a power line across agricultural land will cause crop damage, compaction of the land used, and potentially other damage to farming operations that must be factored into the compensation.Landowners should be aware that there is frequently room to negotiate the value of property subject to eminent domain, and that the public authority's first offer need not always be taken.** Each state has its own process that must be carefully followed for condemnation, and agreements may be able to be reached without litigation or other adverse proceedings or appeals.

# *Wind Farm Pollution*

## What Does a Farmer Need to Know About Wind Energy?

**18** – The claim that wind energy is "green" or "environmentally friendly" is laugh-out-loud hilarious – except for the fact that the reality is not funny at all. Consider just one part of a turbine, the generator, which uses considerable rare earth elements (2000± pounds per MW). The mining and processing of these metals has horrific environmental consequences that are unacknowledged and ignored by the wind industry and its environmental surrogates. For instance, just the rare earths of a typical 100 MW wind project would generate approximately:

***a) 20,000 square meters of destroyed vegetation,***

***b) 1.2 million pounds of CO2,***

***c) 6 million cubic meters of toxic air pollution,***

***d) 29 million gallons of poisoned water,***

***e) 600 million pounds of highly contaminated tailing sands, and***

***f) 280,000 pounds of radioactive waste.***

***Paraphrasing Dr. Jon Boone:***

***Let's see the real world evidence for the lobbyists' case. I'm weary of these relentless projections, uncontaminated as they are by reality. In a nutshell, what these profiteers are seeking to do, through methodological legerdemain, is to make wind appear to be what it is not. This is a plot lifted out of Cinderella and her step-sisters, or the Emperor's New Clothes. It's really a story of class aspirations, but one that is bizarrely twisted: giving wind a makeover to make her seem fetching and comely when in fact she's really a frog.***

# *Bird Deaths*

Wind energy is frequently touted as a clean, green source of energy that can reduce our dependence on fossil fuels.

But like all sources of energy, wind power comes at a cost — one that's too often borne by eagles, hawks, falcons, owls and other birds.

Wind turbines kill more than 573,000 birds each year in the United States, according to The Associated Press, including federally protected species like bald

eagles and golden eagles.

Though it can appear as though they're turning at a slow, almost relaxed pace, wind-turbine blades actually move very rapidly: The outer tips of some turbines' blades can reach speeds of 179 mph (288 kilometers per hour) and can easily slice off an eagle's wing.

And when hawks, falcons and eagles are flying, they're usually looking down at the ground for prey, not glancing up to watch for a knifelike blade whipping down on them from above.

"There is nothing in the evolution of eagles that would come near to describing a wind turbine," Grainger Hunt, a raptor specialist with the Peregrine Fund, told the AP. "There has never been an opportunity to adapt to that sort of threat."

***http://www.livescience.com/31995-how-do-wind-turbines-kill-birds.html***

# *Success Story*

**AVON, SOUTH DAKOTA** — Gregg Hubner isn't interested in more wind turbines in his neighborhood.

Hubner, who built a new house in 2012 about 2.5 miles north of Avon, is leading an effort to inform local residents about another proposed wind farm in the area.

Last month, Ron Hornstra, of B&H Wind, and Roland Jurgens, a consultant with Carstensen Energy, briefed the Bon Homme County commissioners about plans to build another wind farm.

This proposed wind farm project would be located in Bon Homme and Charles Mix counties. The first project – now known as Project Beethoven, after receiving a name from its new ownership – was built in Bon Homme, Charles Mix and Hutchinson counties. The newly proposed project, they said, would consist of at least 50 to 60 turbines.

The South Dakota Public Utilities Commission, not the counties, would have to approve the project because it would likely produce more than 100 megawatts of power.

Hubner said he's against the project for two main reasons. First, the turbines, he said, would ruin the landscape of his land to possibly drive down property values in the area. Second, the ownership of the first wind farm project, Project Beethoven, was sold to a multinational company that doesn't have the best interest

of Bon Homme County in mind, Hubner said.

"We love where we live because of the scenery and the view, and having wind turbines near here would ruin the landscape," he said. "This is my home, and we just don't want anything to do with this."

He's also concerned with potential health issues, such as trouble sleeping near the turbines.

During Hubner's informal meeting Thursday. He spoke to about 25 people at his home, and they also heard from Winnie Peterson, of Canton. Peterson and her neighbors formed a group that successfully opposed a wind farm project last month near Sioux Falls in Lincoln County.

**http://www.wind-watch.org/news/2015/03/16/no-more-wind-farms-says-avon-man/**

# *A MUST WATCH DOCUMENTARY*

# Down Wind, The Truth About Wind Scam

***http://www.flaginc.org/publication/farmers-guide-to-wind-energy-legal-issues-in-farming-the-wind/***

# *Other Useful Websites*

***http://mothersagainstturbines.com/2015/05/09/farm-owners-property-as-security-for-wind-farm-financing-what-owners-need-to-know/***

***https://www.masterresource.org/grassroots-opposition/20-bad-things-wind-3-reasons-why/***

***http://betterplan.squarespace.com/todays-special/tag/wind-farm-cows***

**http://www.slideshare.net/JohnDroz/energy-presentationkey-presentation**

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Mountain-Prairie Region

IN REPLY REFER TO:
FWS/R6/ES

MAILING ADDRESS:
P.O. BOX 25486, DFC
Denver, Colorado 80225-0486

STREET LOCATION:
134 Union Boulevard
Lakewood, Colorado 80228-1807


Mr. Pat O'Meara
Chief Executive Officer
Wind Quarry
330 S. 9th St.
Montrose, Colorado 81401

Dear Mr. O'Meara,

The U.S. Fish and Wildlife Service's (Service) Mountain-Prairie Region (Region 6) is contacting wind energy developers and operators to assist them in complying with federal wildlife laws. We recognize the importance of wind energy to the Nation's economy and energy independence, and also the importance of ensuring the development and operation of wind energy infrastructure is done in an environmentally responsible manner. Although wind energy does not have the carbon footprint of fossil fuels, it can have unique impacts to wildlife and their habitats. We encourage you to coordinate with the Service early in the planning process so we can provide technical assistance in evaluating and minimizing the impacts to our America's wildlife and habitat resources. The optimal time to seek guidance from the Service is prior to making decisions on siting. This allows the greatest flexibility to adapt plans and avoid adverse impacts on federally protected wildlife and their habitats. If your project is past the planning phase and wildlife mortality is occurring, it is still important for you to seek guidance from the Service on how to avoid or minimize impacts to wildlife. However, solutions to avoid wildlife mortality become increasingly difficult after infrastructure is in place and operating.

The Service administers natural resource protection laws pertinent to wind energy production and electrical transmission. These laws include the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 et seq.), the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d), the Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.) as amended, and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57). In addition, the Service also regularly reviews documents prepared by other Federal agencies that are required by the National Environmental Policy Act (42 U.S.C. 4321 et seq.).

**Migratory Birds and Eagles**

The MBTA prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulation. Currently, the list of migratory birds protected under the MBTA includes more than 1,000 species (50 CFR 10.13). The take of migratory birds at wind energy facilities is an ongoing Service concern, particularly the take of *Birds of Conservation Concern* (USFWS 2008), species that may become candidates for listing under the ESA. We encourage you to

work closely with Service biologists to identify take avoidance measures and mortality monitoring protocols and to implement those measures during construction and operation of your facilities.

The BGEPA affords eagles additional protections beyond those provided by the MBTA, in particular, by making it unlawful to "molest or disturb" eagles or destroy their nests. Unlike the MBTA, the take of eagles may be permitted when the taking is: 1) associated with, but not the purpose of the activity, and cannot practicably be avoided, and 2) where the take is compatible with the preservation of eagle populations, which means it must be consistent with the goal of stable or increasing breeding populations. Information concerning eagle take permits can be acquired from the Service Field Office contacts found at the end of this letter.

**Threatened and Endangered Species**

Under the ESA, it is unlawful for any person to "take" any federally listed threatened or endangered wildlife species. Consequently, it is a violation of Federal law to take listed species *or their habitat* without appropriate permits even if the take is accidental (e.g., mortality as a result of collision with a wind turbine blade or distribution line). Take of federally listed species incidental to a lawful activity may be exempted through formal consultation under section 7(a)(2) of the ESA whenever a Federal agency, Federal funding, or a Federal permit is involved. Otherwise, a person or organization may seek an incidental take permit under section 10(a)(1)(B) of the ESA upon completion of a satisfactory habitat conservation plan (HCP) for a listed species. There is no mechanism for exempting or authorizing incidental take after-the-fact. For more information regarding formal consultation and HCPs, please see the Endangered Species Consultation Handbook, http://www.fws.gov/endangered/esa-library/index.html#consultations and the Service's HCP website, http://www.fws.gov/Endangered/esa-library/index.html#hcp

**Conservation Guidance**

*Land-Based Wind Energy Guidelines*

In July 2013, the Service finalized the Land-Based Wind Energy Guidelines (WEG). The WEG were developed in coordination with wind energy companies, non-governmental organizations, and state agencies and tribes with the purpose of informing and guiding the development, construction, operation, and decommissioning of wind energy facilities in the United States. The WEG can be found on our website at http://www.fws.gov/ecological-services/es-library/pdfs/WEG_final.pdf.

*Bird and Bat Conservation Strategy*

The Service recommends companies prepare written records of their plans and actions to avoid, minimize and compensate for potential adverse impacts to birds and bats from wind energy projects through the development and implementation of a Bird and Bat Conservation Strategy (BBCS). A BBCS describes a company's adherence to the WEG and includes relevant details about actions a company is taking to address wildlife conservation concerns. Companies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans and/or BBCSs, and to implement those measures prior to and during project construction and operation. Our Field Office staff can provide technical assistance to developers and operators in navigating through the WEG and BBCS processes.

*Eagle Conservation Plan Guidance*
The Service has developed Eagle Conservation Plan Guidance (ECPG) that provides information for avoiding the take of bald and golden eagles in the course of siting, constructing, and operating wind energy facilities. The ECPG supplements the WEG and also calls for wind energy developers to take a tiered approach to siting new projects. Both documents call for preliminary landscape-level assessments to evaluate potential wildlife interactions and coordination with the Service to accomplish appropriate site-specific surveys and risk assessments prior to construction. The ECPG also provides a possible pathway to wind energy companies and operators for obtaining programmatic eagle take permits in accordance with the BGEPA and the Eagle Permit Rule (74 FR 46836; September 11, 2009). The ECPG may be accessed online at: (http://www.fws.gov/ecological-services/es-library/pdfs/Eagle_Conservation_Guidance-Module%201.pdf). More information about eagle take permits can be provided from Service Field Office Offices or the Region 6 Migratory Bird Management Office.

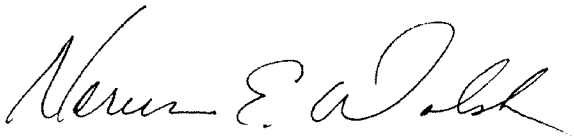
**Legal Requirements and Responsibilities**
The federal laws listed above all contain prohibitions on taking, including killing, injuring and in some cases disturbing, federally protected species without exemption or authorization from the Service. The guidance referenced above describes ways to comply with those laws. The Service's Office of Law Enforcement (OLE) carries out its mission not only by investigations and prosecution but also by fostering valuable working relationships with individuals, companies, and industries that have taken prudent and effective steps to avoid take of federally protected species. The OLE will focus its investigative efforts on those that take federally protected species without identifying and implementing all reasonable, prudent and effective measures to avoid that take. We expect companies to secure prior authorization from the Service as described above for any take of eagles or threatened or endangered species that is reasonably expected to occur.

**Service Contacts**
Please accept our offer of technical assistance and coordinate with your local field office early in your project planning process to ensure you avoid unnecessary impacts on wildlife and have realistic expectations about the permitting process for your project. Our local field offices have site-specific expertise about species that may be affected, sensitive or rare habitats in the project area, and can provide advice on sampling and monitoring protocols. Our Field Office contacts are:

Colorado: Sandy Vana-Miller, Denver; 303-236-4748; Sandy_Vana-miller@fws.gov
Kansas: Dan Mulhern, Manhattan; 785-539-3474, ext. 109; Dan_Mulhern@fws.gov
Montana: Brent Esmoil, Helena; 406-449-5225, ext. 215; Brent_Esmoil@fws.gov
Nebraska: Eliza Hines, Grand Island; 308-382-6468, ext. 204; Eliza_Hines@fws.gov
North Dakota: Kevin Shelley, Bismarck; 701-355-8512; Kevin_Shelley@fws.gov
South Dakota: Natalie Gates, Pierre; 605-224-8693; Natalie_Gates@fws.gov
Utah: Betsy Herrmann, Salt Lake City; 801-975-3330, ext. 139; Betsy_Herrmann@fws.gov
Wyoming: Tyler Abbott, Cheyenne; 307-772-2374, ext. 231; Tyler_Abbott@fws.gov

In addition, personnel in our Regional Office are available to facilitate coordination and provide technical assistance. For information regarding migratory birds please contact Brian Smith, Division of Migratory Bird Management, via email at brian_w_smith@fws.gov or via phone at 303-236-4403. For general assistance, please contact Maria Boroja, Regional Energy Coordinator, via email at maria_boroja@fws.gov or via phone at 303-236-4518. Thank you for taking the opportunity to work with the Service to fulfill our Nation's expectation of producing wind energy in an environmentally responsible manner.

Sincerely,



Regional Director

# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

**Ecological Services**
**420 South Garfield Avenue, Suite 400**
**Pierre, South Dakota 57501-5408**

November 16, 2015

Mr. Lou Hanebury
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, Montana 59107-5800

Re: Wind Quarry, LLC, Willow Creek Project,
Butte County, South Dakota

Dear Mr. Hanebury:

This letter is in response to your request dated October 30, 2015, for an updated species list and any new information/guidance relative to the above referenced project, a wind energy facility in Butte County, South Dakota.

Our agency previously provided information and recommendations for this project to the developers, their consultant, and your agency regarding birds of conservation concern, wetlands, prairie dogs, grouse, eagles, bats, candidate species, proposed species and listed species. We provided applicable guidelines including our Land-Based Wind Energy Guidelines, Region 6 Bird and Bat Conservation Strategy Guidance, Draft Eagle Conservation Plan Guidance, as well as guidance relative to power line impacts to birds.

Per our joint site visit earlier this year, we noted that the potential impact to wildlife by siting a wind energy facility in this landscape is relatively high. The project area is dominated by intact grassland, primarily used as pasture. During our site visit and during wildlife surveys conducted by the project consultant, birds of conservation concern, raptors, grouse, and eagles were observed in the project area. We provided some turbine siting recommendations during our site visit to reduce potential risk for wildlife. We also recommended habitat offsets for species likely to be impacted indirectly by the presence of turbines on the landscape per a recent study documenting avoidance of turbines to 300 m or more by some species (Shaffer and Buhl 2015).

Regarding your request for additional guidance, the November 3, 2015, Presidential Memorandum: Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment directs federal agencies to first avoid and minimize impacts to natural resources, and then to compensate for remaining impacts, with an eye toward opportunities to promote non-profit and private investments in restoration or enhancement efforts. See:

*https://www.whitehouse.gov/the-press-office/2015/11/03/mitigating-impacts-natural-resources-development-and-encouraging-related* for the details of this memo, which includes establishment of net benefit - or at minimum, no net loss - goals for important resources.

Overall, we continue to recommend against siting the Willow Creek wind facility in its currently proposed location which is dominated by grasslands and serves as an important area for wildlife, and instead promote establishment of such facilities in previously disturbed locations (e.g. cropland). Secondarily, we submit that if this project moves forward to construction in its current location, compensation for grassland habitat loss, fragmentation, and indirect impacts should be pursued in order to achieve the goals identified in the aforementioned Presidential Memorandum.

Regarding your request for an updated species list, note that the status of two species identified in our November 26, 2014, letter has changed. As you know, the Northern long-eared bat is no longer a proposed species, and the greater sage grouse is no longer a candidate species. Updated information is provided below.

In accordance with section 7(c) of the Endangered Species Act (ESA), as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed species may occur in the project area (this list is considered valid for 90 days):

| Species | Status | Expected Occurrence |
|---|---|---|
| Whooping crane (*Grus americana*) | Endangered | Migration |
| Northern Long-eared Bat (*Myotis septentrionalis)* | Threatened | Potential summer resident, seasonal migrant; known winter resident in Black Hills |

The proposed project location is just west of the boundary of the documented migration corridor of the Aransas/Wood Buffalo population of whooping cranes within which 95 percent of documented sightings have been reported; however, whooping crane sightings in South Dakota do occur outside that corridor, and confirmed records exist near the proposed wind facility location. Whooping cranes migrate through South Dakota twice annually on their way to northern breeding grounds and southern wintering areas. They occupy numerous habitats such as cropland and pastures; wet meadows; shallow marshes; shallow portions of rivers, lakes, reservoirs, and stock ponds; and both freshwater and alkaline basins for feeding and loafing. Overnight roosting sites frequently require shallow water in which to stand and rest. Whooping cranes are large birds with low maneuverability. Line strike mortality is the greatest known threat to fledged whooping cranes; more information on this topic is provided below. Sightings of whooping cranes at any time should be reported to this office.

The northern long-eared bat is a medium-sized brown bat listed as threatened under the Endangered Species Act. Northern long-eared bats are known to be present in South Dakota during the summer months, primarily roosting singly or in colonies underneath bark, in cavities or in crevices of both live and dead trees. Some hibernacula have been documented in caves/mines in the Black Hills, and the species has been documented in other forested areas in the state during the summer months, and along the Missouri River during migration. White nose syndrome - a fungus affecting

hibernating bats - is considered a significant threat to this species, but individuals may be harmed by other activities such as modifications to hibernacula, timber harvest, human disturbance, and collisions with wind turbines. Currently, feathering turbine blades and increasing cut-in speeds are recommended measures to reduce the risk of bat mortality at wind generation facilities. An interim (4(d)) rule has been published that exempts take of Northern long-eared bats in certain circumstances. For more information, see: https://www.fws.gov/Midwest/Endangered/mammals/nleb/index.html.

Additionally, the following candidate species may occur in the area:

| Species | Status | Expected Occurrence |
|---|---|---|
| Sprague's pipit (*Anthus Spragueii*) | Candidate | Possible Breeding/Migration. |

Sprague's pipit was determined to be a candidate species in September of 2010. As a candidate, the Sprague's pipit is not currently afforded Federal protection under the ESA but is protected under the Migratory Bird Treaty Act (MBTA). It has been identified as a species in decline that the Service believes needs to be listed as threatened or endangered, but listing is currently precluded by other priorities. Sprague's pipit is a grassland songbird currently found only in remnant large grassland patches in the northern mixed-grass native prairie of North America. In the United States, the species' breeding range includes north-central and eastern Montana, central and western North Dakota, and northwestern and north-central South Dakota. The Sprague's pipit is likely influenced by the size of grassland patches and the amount of grassland in the landscape. This species also negatively responds to shrub and tree densities, and it is likely that it exhibits negative responses to other vertical structures in their habitat (e.g., wind turbines, telecommunication towers, power line towers), although specific data are limited. Sprague's pipit is among the species named within the Service's 2008 Birds of Conservation Concern publication – available online at: (http://www.fws.gov/migratorybirds/NewReportsPublications/ SpecialTopics/BCC2008/ BCC2008.pdf); species which have been identified as in need of conservation efforts to stem population declines. Habitat loss, degradation, fragmentation, inappropriate management, nest predation and parasitism, energy development, climate change, and drought are threats that currently or potentially affect Sprague's pipit populations throughout its range. Management for this species consists of protecting, maintaining, and restoring mixed grass prairie in suitably large blocks (over 70 acres). To view the Sprague's pipit (*Anthus spragueii*) Conservation Plan from which the above information was obtained and for additional information including the 12-month finding that established the Sprague's pipit as a candidate species, please access the following website: http://www.fws.gov/mountain-prairie/species/birds/spraguespipit/.

If the Western Area Power Administration, or a designated representative, determines that the project "may adversely affect" listed species, you must request formal consultation from this office. If a "no effect" determination is made, further consultation may not be necessary. However, a copy of the "no effect" determination for this project should be sent to this office.

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide comments. If you have any questions on these comments, please contact Natalie Gates of this office at (605) 224-8693, Extension 227.

Sincerely,

Natalie Gates

for Scott V. Larson
Field Supervisor
South Dakota Field Office

cc: Secretary, SDDGFP; Pierre, SD
(Attention: Silka Kempema)

Literature Cited:

Shaffer, J. A. and D. A. Buhl. 2015. Effects of wind-energy facilities on breeding grassland bird distributions. Conservation Biology. Volume 00, No. 0, 1–13.

**Department of Energy**
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

OCT 30 2015

B0403.BL

Mr. Scott Larson
North and South Dakota Field Supervisor
U. S. Fish and Wildlife Service
420 S. Garfield Avenue, Suite 400
Pierre, SD 57501

Dear Mr. Larson:

Western Area Power Administration (Western), an agency within the United States Department of Energy, owns and operates a bulk electrical transmission system to support sales of federally-generated hydropower to customers throughout the western United States. As you are aware, Wind Quarry, LLC has applied to interconnect a proposed wind energy generation project, Willow Creek, (Project) to Western's bulk electric transmission system under Western's Open Access Transmission Tariff and we are progressing through the NEPA process (as a project tiered off of our programmatic wind EIS).

On October 24, 2014 Western requested species occurrence information relative to the proposed wind project. On November 26, 2014 your office responded with listed species information and guidance. We are now requesting an updated species occurrence list and any new information or guidance pertaining to this project.

If you have any questions or comments regarding this request, please feel free to contact me at (406) 255-2812.

Sincerely,

Lou Hanebury
Environmental Protection Specialist

cc:
John O'Meara

# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

**Ecological Services**
**420 South Garfield Avenue, Suite 400**
**Pierre, South Dakota 57501-5408**

November 26, 2014

Mr. Lou Hanebury
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, Montana 59107-5800

Re: Wind Quarry, LLC, Willow Creek Project,
Butte County, South Dakota

Dear Mr. Hanebury:

This letter is in response to your request dated October 24, 2014, (received by this office October 31, 2014), for species occurrence information relative to the above referenced project involving the interconnection of a wind energy generation project and associated potential rebuild of a 115 kV transmission line to a 230 kV line located approximately 15 miles northeast of Newell, Butte County, South Dakota. We herein provide that species information, as well as additional environmental recommendations regarding the proposed project.

Our agency previously provided information on this project to the Bureau of Land Management (BLM) when the project had been proposed on some BLM lands (our April 14, 2011, letter is attached for your records).

We have also been in contact with John and Patrick O'Meara of Wind Quarry, and their consultant Eric Atkinson, regarding wildlife assessments on the proposed project area. The project proponents have provided habitat and species survey information to our agency and to South Dakota Game Fish and Parks (SDGFP). Our office has provided them with information and recommendations regarding birds of conservation concern; Land-Based Wind Energy Guidelines; Region 6 Bird and Bat Conservation Strategy Guidance; Draft Eagle Conservation Plan Guidance; and species-specific information on prairie dogs, grouse, Sprague's pipit, eagles, and bats. SDGFP has also provided input on these issues, plus State listed species and State Species of Greatest Conservation Concern.

The project location has shifted from BLM land to private land, so we are uncertain whether all of the issues raised to date remain a concern at this facility. However, please note that the proponents have been informed that the risk to wildlife is deemed relatively high for a wind farm in this area, and have we recommended avoiding siting a facility there.

**Wind Energy Guidelines**

As you know, among the Service's primary concerns regarding wind turbines are avian collision mortality and the loss of habitat/habitat avoidance behaviors by wildlife. The *U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines* are designed to help wind energy project developers avoid and minimize impacts of land-based wind projects on wildlife and their habitats. The Guidelines are available at: http://www.fws.gov/windenergy/. If the proposed project is to be constructed, we request the results of any pre-/post-construction wildlife monitoring, including any incidental mortality detected. The Before-After-Control-Impact (BACI) method for avian studies is recommended and described further in the guidelines as-is the Bird and Bat Conservation Strategy.

**Threatened, Endangered, and Candidate Species**

In accordance with section 7(c) of the Endangered Species Act (ESA), as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed species may occur in the project area (this list is considered valid for 90 days):

| Species | Status | Expected Occurrence |
|---|---|---|
| Whooping crane (*Grus americana*) | Endangered | Migration |

The proposed project location is just west of the boundary of the documented migration corridor of the Aransas/Wood Buffalo population of whooping cranes within which 95 percent of documented sightings have been reported; however, whooping crane sightings in South Dakota do occur outside that corridor, and confirmed records exist near the proposed wind facility location. Whooping cranes migrate through South Dakota twice annually on their way to northern breeding grounds and southern wintering areas. They occupy numerous habitats such as cropland and pastures; wet meadows; shallow marshes; shallow portions of rivers, lakes, reservoirs, and stock ponds; and both freshwater and alkaline basins for feeding and loafing. Overnight roosting sites frequently require shallow water in which to stand and rest. Whooping cranes are large birds with low maneuverability. Line strike mortality is the greatest known threat to fledged whooping cranes; more information on this topic is provided below. Sightings of whooping cranes at any time should be reported to this office.

The following proposed species may also occur in the project area:

| Species | Status | Expected Occurrence |
|---|---|---|
| Northern Long-eared Bat (*Myotis septentrionalis)* | Proposed Endangered | Summer resident, seasonal migrant, known winter resident in Black Hills |

The northern long-eared bat is a medium-sized brown bat that has been proposed for listing as endangered under the Endangered Species Act (see: <http://www.fws.gov/midwest/endangered/mammals/nlba/pdf/FRpropListNLBA2Oct2013.pdf> for more information). Their proposed status defines these bats as a species in decline that the Service believes needs to be listed. Actions that may jeopardize the continued existence of this proposed species may require conference procedures in coordination with the Service.

Northern long-eared bats range across much of the eastern and north-central United States and Canada. They are known to be present in South Dakota during the summer months, primarily roosting singly or in colonies underneath bark, in cavities or in crevices of both live and dead trees. Some have been found hibernating in caves/mines in the Black Hills in the winter months. White nose syndrome is a significant threat to this species, but other sources of mortality have contributed to its decline. Wind turbines kill bats, including northern long-eared bats. An evaluation of whether to list this species is underway with a decision anticipated in the spring of 2015.

Additionally, the following candidate species may occur in the area:

| Species | Status | Expected Occurrence |
|---|---|---|
| Sprague's pipit (*Anthus Spragueii*) | Candidate | Possible Breeding/Migration. |
| Greater Sage Grouse (*Centrocercus Urophasianus*) | Candidate | Known resident |

Sprague's pipit was determined to be a candidate species in September of 2010. As a candidate, the Sprague's pipit is not currently afforded Federal protection under the ESA but is protected under the Migratory Bird Treaty Act (MBTA). It has been identified as a species in decline that the Service believes needs to be listed as threatened or endangered, but listing is currently precluded by other priorities. Sprague's pipit is a grassland songbird currently found only in remnant large grassland patches in the northern mixed-grass native prairie of North America. In the United States, the species' breeding range includes north-central and eastern Montana, central and western North Dakota, and northwestern and north-central South Dakota. The Sprague's pipit is likely influenced by the size of grassland patches and the amount of grassland in the landscape. This species also negatively responds to shrub and tree densities, and it is likely that it exhibits negative responses to other vertical structures in their habitat (e.g., wind turbines, telecommunication towers, power line towers), although specific data are limited. Sprague's pipit is among the species named within the Service's 2008 Birds of Conservation Concern publication (http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf); species which have been identified as in need of conservation efforts to stem population declines. Habitat loss, degradation, fragmentation, inappropriate management, nest predation and parasitism, energy development, climate change, and drought are threats that currently or potentially affect Sprague's pipit populations throughout its range. Management for this species consists of protecting, maintaining, and restoring mixed grass prairie in suitably large blocks (over 70 acres). To view the Sprague's pipit (*Anthus spragueii*) Conservation Plan from which the above information was obtained and for additional information including the 12-month finding that established the Sprague's pipit as a candidate species, please access the following website: http://www.fws.gov/mountain-prairie/species/birds/spraguespipit/.

Like the Sprague's pipit, the greater sage-grouse (*Centrocercus urophasianus*) is a candidate species, not currently afforded Federal protection under the ESA. The status of the sage-grouse is currently being evaluated by the Service and a determination of whether or not to propose the species for listing is anticipated in September of 2015. Greater sage-grouse are dependent on sagebrush habitats year-round.

Habitat loss and degradation, as well as loss of population connectivity have been identified as important factors contributing to the decline of greater sage-grouse populations rangewide. Therefore, any activities that result in loss or degradation of sagebrush habitats that are important to this species should be closely evaluated for their impacts to sage-grouse.

If the Western Area Power Administration, or a designated representative, determines that the project "may adversely affect" listed species, you must request formal consultation from this office. If a "no effect" determination is made, further consultation may not be necessary. However, a copy of the "no effect" determination for this project should be sent to this office.

**Bald and Golden Eagles**

Your October 24, 2014, letter requested the most current information on bald and golden eagles, or where to find such information. We were aware of at least three records of known occupied bald eagle nests exist within approximately 10 miles of the proposed project area when we provided our April 14, 2011, letter to the BLM, but the location of the project has since changed. Eagle surveys have been undertaken at the proposed project location by the developers' contractor, thus, if they have not already provided it, you might request that data from Wind Quarry. Additionally, SDGFP has collected bald and golden eagle nest locations in the state; we recommend you contact Silka Kempema for more details (phone: 605-773-2742).

While ESA protection for the bald eagle has been removed, effective August 8, 2007, the species will continue to be protected under the MBTA and the Bald and Golden Eagle Protection Act (more on these laws below). These laws protect bald eagles from a variety of harmful actions and impacts. Our agency has developed guidance for the public regarding means to avoid take of the bald eagle under these laws. The *National Bald Eagle Management Guidelines* are available online at: http://www.fws.gov/northeast/ecologicalservices/eaglenationalguide.html. We recommend reviewing these guidelines as they serve to advise of circumstances where these laws may apply and assist in avoiding potential violations on future projects. The Service has developed the *Eagle Conservation Plan Guidance* which may be found at: http://www.fws.gov/windenergy/eagle_guidance.html. Additionally, permit regulations have recently been published which authorize limited take of bald and golden eagles. During past contacts with Wind Quarry, they expressed an interest in developing an Eagle Conservation Plan, but were not necessarily interested in obtaining a permit. We have not yet received an Eagle Conservation Plan from them.

**Wetlands**

According to National Wetlands Inventory maps (available online at http://wetlands.fws.gov/), wetlands exist within the proposed project area. If a project may impact wetlands or other important fish and wildlife habitats, the Service, in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible; then minimization of any adverse impacts; and finally, replacement of any lost acres; in that order. Alternatives should be examined and the least damaging practical alternative selected. If wetland impacts are unavoidable, a mitigation plan addressing the number and types of wetland acres to be impacted and the methods of replacement should be prepared and submitted to the resource agencies for review.

**Birds of Conservation Concern**

The Migratory Birds Division of the Service has published *Birds of Conservation Concern 2008*, which may be found online at: http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf. This document is intended to identify species in need of coordinated and proactive conservation efforts among State, Federal, and private entities, with the goals of precluding future evaluation of these species for ESA protections and promoting/conserving long-term avian diversity. A primary threat to many grassland species that occur in South Dakota is habitat loss and fragmentation. In accordance with Executive Order 13186 regarding migratory bird protection, we recommend avoidance, minimization, and finally compensation to reduce the impacts to species protected by the MBTA. Compliance with this law may be partially addressed in a Bird and Bat Conservation Strategy; however, a separate mitigation plan that specifically addresses take of habitat during and after construction is also recommended. Particularly if placement must occur within intact native grasslands (as appears to be probable if development occurs in the proposed project area), we strongly recommend development of mitigative/offsetting measures for this habitat and its associated wildlife. These measures may include, but not be limited to, purchase of easements or fee title lands.

**Power Lines**

Overhead power lines at the proposed project pose the threat of avian electrocution, particularly for raptors. Thousands of these birds, including endangered species, are killed annually as they attempt to utilize overhead power lines as nesting, hunting, resting, feeding, and sunning sites. The Service recommends the installation of underground, rather than overhead, power lines whenever possible/appropriate to minimize environmental disturbances. For all new overhead lines or modernization of old overhead lines, we recommend incorporating measures to prevent avian electrocutions. The publication entitled *Suggested Practices for Avian Protection on Power Lines - The State of the Art in 2006* has many good suggestions, including pole extensions, modified positioning of live phase conductors and ground wires, placement of perch guards and elevated perches, elimination of cross arms, use of wood (not metal) braces, and installation of various insulating covers. You may obtain this publication by contacting the Edison Electric Institute via their website at www.eei.org or by calling 1-800-334-5453.

Please note that utilizing just one of the "Suggested Practices . . ." methods may not entirely remove the threat of electrocution to raptors. In fact, improper use of some methods may increase electrocution mortality. Perch guards, for example, may be only partially effective as some birds may still attempt to perch on structures with misplaced or small-sized guards and may suffer electrocution as they approach too close to conducting materials. Among the most dangerous structures to raptors are poles that are located at a crossing of two or more lines, exposed above-ground transformers, or dead end poles. Numerous hot and neutral lines at these sites, combined with inadequate spacing between conductors, increase the threat of raptor electrocutions. Perch guards placed on other poles have, in some cases, served to actually shift birds to these more dangerous sites, increasing the number of mortalities. Thus, it may be necessary to utilize other methods or combine methods to achieve the best results. The same principles may be applied to substation structures.

Please also note that the spacing recommendation within the "Suggested Practices . . ." publication of at least 60 inches between conductors or features that cause grounding may not be protective of larger raptors such as eagles. This measure was based on the fact that the skin-to-skin contact distance on these birds (i.e., talon to beak, wrist to wrist, etc.) is less than 60 inches. However, an adult eagle's wingspan (distance between feather tips) may vary from 66 to 96 inches depending on the species (golden or bald) and gender of the bird. Unfortunately, wet feathers in contact with conductors and/or grounding connections can result in a lethal electrical surge. Thus, the focus of the above precautionary measures should be to a) provide more than 96 inches of spacing between conductors or grounding features, b) insulate exposed conducting features so that contact will not cause raptor electrocution, and/or c) prevent raptors from perching on the poles in the first place.

Additional information regarding simple, effective ways to prevent raptor electrocutions on power lines is available in video form. *Raptors at Risk* may be obtained by contacting EDM International, Inc. at 4001 Automation Way, Fort Collins, Colorado 80525-3479, Telephone No. (970) 204-4001, or by visiting their website at: http://www.edmlink.com/raptorvideo.htm.

In addition to electrocution, overhead power lines also present the threat of avian line strike mortality. Particularly in situations where these lines are adjacent to wetlands or where waters exist on opposite sides of the lines, we recommend marking them in order to make them more visible to birds. For more information on bird strikes, please see *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* which may be obtained by contacting the Edison Electric Institute at the same website and telephone number listed above. Please note that, while marking of power lines reduces line strike mortality, it does not preclude it entirely. Thus, marking of additional, existing, overhead lines is recommended to further offset the potential for avian line strike mortality.

**Migratory Bird Treaty Act**

Although adherence to the Service's recommendations will provide some protection for migratory birds, implementation of these measures alone will not remove any liability should violations of the law occur. The MBTA prohibits the taking, killing, possession, and transportation (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the MBTA has no provision for allowing unauthorized take, the Service realizes that some birds may be killed during construction or operation of a wind energy facility even if all known reasonable and effective measures to protect birds are used. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to avoid take of migratory birds and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent, and effective measures to avoid that take. Companies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans to implement conservation measures prior to/during construction, operation, and any associated activities.

**South Dakota Department of Game, Fish and Parks**

***South Dakota Wind Power Guidelines.*** Please note that the SDGFP has coordinated with the South Dakota Public Utilities Commission (SDPUC) regarding distribution of SDGFP's *Siting Guidelines for Wind Power Projects in South Dakota* to wind developers intending to construct projects within the state of South Dakota. You may wish to contact the SDPUC and/or the Silka Kempema of SDGFP in Pierre for more information.

***Bats.*** Bats are known to suffer mortality due to wind turbines. The SDGFP has completed a State Management Plan for bats (see: http://gfp.sd.gov/wildlife/management/plans/bat-management-plan.aspx) and may be able to provide additional information and/or recommendations on bats relative to this project. Again, Ms. Kempema is your contact for more information regarding these issues and other concerns relative to wind energy that fall under that agency's purview.

**Summary**

The following items are pertinent to the proposed project, and we recommend addressing these issues if/when the project progresses:

- Impacts to the whooping crane, northern long-eared bat, Sprague's pipit, and greater sage-grouse
- Bald and golden eagle impacts; see the Service's *National Bald Eagle Management Guidelines* and *Eagle Conservation Plan Guidance*
- Offsets for high value grassland/wetland habitat impacts
- Migratory bird impacts (MBTA), including birds of conservation concern, with application of pre-/post-construction monitoring and mortality data and mitigative/offsetting measures to be coordinated with and reported to the Service
- Existing guidelines for various project components:
    a) Wind Facilities: *U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines*
    b) Overhead Power Lines: APLIC's *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006,* and *Reducing Avian Collisions with Power Lines: The State of the Art in 2012.*
- SDDGFP wind siting guidelines and bat management plan

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide comments. If you have any questions on these comments, please contact Natalie Gates of this office at (605) 224-8693, Extension 227.

Sincerely,

Scott V. Larson
Field Supervisor
South Dakota Field Office

cc: Secretary, SDDGFP; Pierre, SD
(Attention: Silka Kempema)

**Department of Energy**
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

OCT 2 4 2014

Mr. Scott Larson, Field Supervisor
U. S. Fish and Wildlife Service
South Dakota Field Office
420 S. Garfield, Suite 400
Pierre, SD 57501

Dear Mr. Larson:

Western Area Power Administration (Western), an agency within the United States Department of Energy, owns and operates a bulk electrical transmission system to support sales of federally-generated hydropower to customers throughout the western United States. Wind Quarry, LLC (Wind Quarry), has applied to interconnect a proposed wind energy generation project, Willow Creek, (Project) to Western's bulk electric transmission system under Western's Open Access Transmission Tariff (OATT). The interconnection request is identified as GI-1401 on Western's Generation Interconnection Queue.

Western's OATT is non-discretionary; if capacity exists on Western's bulk electric transmission system, Western is required by the Energy Policy Act of 2005 to allow generators to interconnect. The interconnection agreement itself is a federal action requiring review under the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4332). Western's federal action has no physical impacts outside of the switchyard boundaries; however, as the lead on the NEPA document, and in accordance with Section 7 of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq. (ESA) Western as the lead agency for listed, threatened and endangered species, is also participating in the section 7 consultation for the proposed Project.

Pursuant to the requirements of section 102 of the NEPA Western will consult on the effects of the interconnection, and the interrelated construction and operation of the wind farm, to federally-listed species under ESA section 7. Western will be preparing a Biological Assessment (BA) for the purpose of identifying any endangered or threatened species which is likely to be affected by such action.

The proposed Project is sited on approximately 40,000 acres of private land. The overall project area is surrounded by various landowners. Lessee properties encompass assorted sections within the following townships in Butte County, South Dakota:

- Township 9 North, Range 8 East of the Black Hills Meridian
- Township 10 North, Range 8 East of the Black Hills Meridian
- Township 10 North, Range 7 East of the Black Hills Meridian
- Township 11 North, Range 7 East of the Black Hills Meridian
- Township 11 North, Range 8 East of the Black Hills

The applicant proposes to construct, operate, and maintain an approximate 325 megawatt (MW) wind energy generating facility. The Project has proposed a Point of Interconnection (POI) at a new Willow Creek Substation on the existing Newell - Maurine 115-kV Transmission Line. In addition to the POI, the Project has proposed the section of 115-kV transmission line from Willow Creek Substation to Maurine Substation, approximately twenty-seven miles, may be rebuilt at 230-kV. Note that Western is currently performing an interconnection system impact study to determine the system improvements required to accommodate the Project. The POI and system improvements proposed by the Project, as described in this letter, may change following Western's completion of the interconnection system impact study.

The proposed Project is located in south-east Butte County, South Dakota. This Project area is located approximately fifteen miles northeast of the city of Newell (project map attached). Permanent Project components will include an underground power collection system, improved access roads, a maintenance building, and a new substation. Temporary disturbances will include staging areas, turbine laydown areas, and crane pads.

Western's Upper Great Plains Regional Office requests a list of threatened, endangered, proposed, and candidate species for the area of this proposed action. For ESA informal consultations and development of BAs, Western's policy is to treat candidate and proposed species as if they were listed species. Thus, the evaluation of impacts and the determination of effects on all species addressed in Western's BA will utilize the threshold for listed species as the basis for analysis of effects and effects determination. Therefore, though not meeting the threshold pursuant to Section 7(a) (4) of the ESA, Western also requests voluntary conferencing on the candidate and proposed species that may be affected by the proposed project.

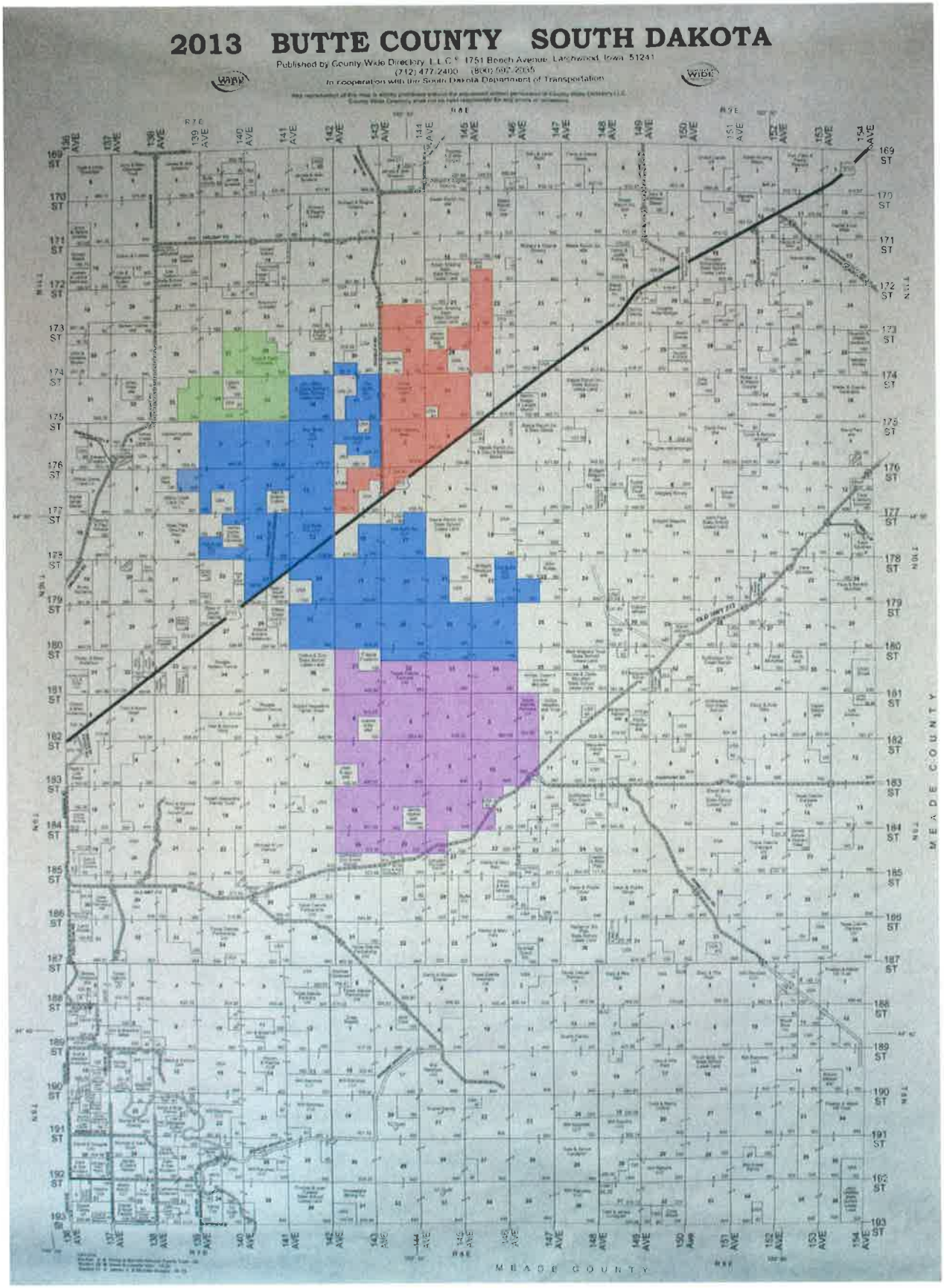
Western's NEPA obligations require that all potential environmental impacts be disclosed and considered and to ensure that quality environmental information is available to agency officials and the public. Western is requesting the most current information on bald and golden eagles within 10 miles of the Project area or a source from which the information can be acquired.

If you have any questions or comments regarding this request, please feel free to contact me at (406) 255-2812.

Sincerely,

Lou Hanebury
Environmental Protection Specialist

cc: John O'Meara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STATE HISTORICAL SOCIETY
DEPARTMENT OF EDUCATION

February 3, 2016

Mr. David W. Kluth
Department of Energy
Western Area Power Administration
Federal Building
200 4TH St. SW
Huron, SD 57350-2475

**SECTION 106 PROJECT CONSULTATION**
Project: 150715016F – Interconnection Request for the Willow Creek Wind Farm
Location: Butte County
(WAPA)

Dear Mr. Kluth:

Thank you for the opportunity to comment on the above referenced project pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended). The South Dakota Office of the State Historic Preservation Officer (SHPO) concurs with your determination regarding the effect of the proposed project on the non-renewable cultural resources of South Dakota.

On January 8, 2016, we received your letter and the report entitled "Level III Cultural Resources Inventory of the Willow Creek Wind Energy Facility, Butte County, South Dakota," prepared by Quality Services, Inc. Based on the recommendations in your letter and the survey report, we concur with the following determinations of eligibility:

- Properties 39BU0144, 39BU0529, 39BU0530, 39BU0531, 39BU0534, 39BU0536, 39BU0540, 39BU0542, 39BU0543, BU00000246, BU00000247 and BU00000248 are considered not eligible for listing in the National Register of Historic Places (National Register) under any of the Criteria;

- Properties BU00300001, BU00300002, BU00300003 and BU00300004 are considered eligible for listing in the National Register under Criteria C;

- Properties 39BU0014, 39BU0142, 39BU0143, 39BU0145, 39BU0158, 39BU0532, 39BU0533, 39BU0535, 39BU0537, 39BU0538, 39BU0539 and 39BU0541 are considered eligible for listing in the National Register under Criteria D;

- Properties 39BU0146, 39BU0147 and 39BU0148 are considered unevaluated for listing in the National Register.

Given the above, we concur with your determination of "No Adverse Effect" for this project based on the following stipulations. Stipulation 1) unevaluated properties, which are being treated as eligible for the purpose of this project, and eligible properties must be physically avoided by all ground disturbing activities. Physical avoidance should include a buffer area around each site that is delineated on the ground to ensure avoidance by heavy equipment. Stipulation 2) please provide SHPO the opportunity to comment on any additional information submitted by other consulting parties concerning the identification of historic properties. Stipulation 3) activities occurring in areas not identified in the request will require the submission of additional documentation pursuant to 36 C.F.R. § 800.4.

If historic properties are discovered or unanticipated effects on historic properties are found after the agency official has completed the Section 106 process, the agency official shall avoid, minimize or mitigate the adverse effects to such properties and notify the SHPO and Indian tribes that might attach religious and cultural significance to the affected property within 48 hours of the discovery, pursuant to 36 C.F.R. § 800.13.

Concurrence of the SHPO does not relieve the federal agency official from consulting with other appropriate parties, as described in 36 C.F.R. § 800.2(c).

Should you require additional information, please contact Paige Olson at Paige.Olson@state.sd.us or (605) 773-6004. Your concern for the non-renewable cultural heritage of our state is appreciated.

Sincerely,

Jay D. Vogt
State Historic Preservation Officer

P Olson

Paige Olson
Review and Compliance Coordinator

cc: Jane Watts, Archaeological Research Center

south dakota
STATE HISTORICAL SOCIETY
DEPARTMENT OF EDUCATION

June 28, 2016

Mr. David W. Kluth
Department of Energy
Western Area Power Administration
Federal Building
200 4TH St. SW
Huron, SD 57350-2475

**SECTION 106 PROJECT CONSULTATION**
Project: 150715016F – Interconnection Request for the Willow Creek Wind Farm – Addendum Cultural Resources Survey
Location: Butte County
(WAPA)

Dear Mr. Kluth:

Thank you for the opportunity to comment on the above referenced project pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended). The South Dakota Office of the State Historic Preservation Officer (SHPO) concurs with your determination regarding the effect of the proposed project on the non-renewable cultural resources of South Dakota.

On June 13, 2016, we received an electronic copy of your letter and the report entitled "Addendum, Level III Cultural Resources Inventory of the Willow Creek Wind Energy Facility, Butte County, South Dakota," prepared by Quality Services, Inc. The original documents were received in the mail on June 14, 2016.

The information provided in the report indicates that no historic properties, as defined by 36 C.F.R. § 800.16(l), were located during the additional survey of the project area. Therefore, we concur with the determination of "No Adverse Effect" of this undertaking based on the stipulations outlined in our previous correspondence dated February 3, 2016.

Activities occurring in areas not identified in the request will require the submission of additional documentation pursuant to 36 C.F.R. § 800.4.

If historic properties are discovered or unanticipated effects on historic properties are found after the agency official has completed the Section 106 process, the agency official shall avoid, minimize or mitigate the adverse effects to such properties and notify the SHPO and Indian tribes that might attach religious and cultural significance to the affected property within 48 hours of the discovery, pursuant to 36 C.F.R. § 800.13.

Concurrence of the SHPO does not relieve the federal agency official from consulting with other appropriate parties, as described in 36 C.F.R. § 800.2(c).

Should you require additional information, please contact Paige Olson at Paige.Olson@state.sd.us or (605) 773-6004. Your concern for the non-renewable cultural heritage of our state is appreciated.

Sincerely,

Jay D. Vogt
State Historic Preservation Officer

P. Olson

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Review and Compliance Coordinator