

APPENDIX I – 2017 RAPTOR NEST SURVEY



2017 Raptor Nest Survey for the Deuel Harvest North Wind Farm

Deuel Harvest Wind Energy LLC

**Deuel Harvest North Wind Farm
Project No. 99578**

**Final
11/27/2018**



2017 Raptor Nest Survey for the Deuel Harvest North Wind Farm

prepared for

**Deuel Harvest Wind Energy LLC
Deuel Harvest North Wind Farm
Deuel County, South Dakota**

Project No. 99578

**Final
11/27/2018**

prepared by

**Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri**

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
Deuel Harvest Wind	Deuel Harvest Wind Energy LLC
ECPG	Eagle Conservation Plan Guidance: Module 1 – Land-based Wind Energy, Version 2
ESA	Endangered Species Act
ft	feet
GPS	Global Positioning System
m	meters
MET	Meteorological
MW	Megawatt
Project	Deuel Harvest North Wind Farm
USFWS	U.S. Fish and Wildlife Service
WEST	Western EcoSystems Technology, Inc.

1.0 INTRODUCTION

Deuel Harvest Wind Energy LLC (Deuel Harvest Wind) plans to construct the Deuel Harvest North Wind Farm (Project), a 300-megawatt (MW) wind farm in Deuel County, South Dakota. The proposed Project would include construction of up to 124 wind turbines, associated access roads and underground collection lines, a Project substation, an interconnection substation, an Operations and Maintenance building, up to 4 meteorological (MET) towers, laydown areas, and other appurtenant facilities. The Project is located approximately 5 miles north of Clear Lake, South Dakota (Figure A-1, in Appendix A).

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) was contracted to conduct a raptor and large bird nest study within the designated Project area in May 2017 to attempt to verify the presence and usage of nests identified during Project surveys in 2016 (Western EcoSystems Technology, Inc. [WEST], 2016). Raptors and large birds may include bald eagles (*Haliaeetus leucocephalus*), hawks (*Buteo* spp.), great horned owls (*Bubo virginianus*), other birds of prey, and great blue herons (*Ardea herodias*), among others. This ground-based survey was completed to facilitate consultation with the U.S. Fish and Wildlife Service (USFWS) and within USFWS guidance including *Eagle Conservation Plan Guidance: Module 1 – Land-based Wind Energy, Version 2* (ECPG) (USFWS, 2013).

1.1 Project Area

The Project Area is located in Deuel County, South Dakota (Figure A-1, Appendix A). This effort included a field review of the large stick nests located during 2016 surveys within the Project area, to the extent practicable. The Project area was historically tall-grass and short-grass prairies within the Northern Glaciated Plains Level III Ecoregion (U.S. Environmental Protection Agency, 2017). Current land uses are dominated by row-crop agriculture, hay and pasture land, other agriculture uses, small town residences and establishment, and wind energy development. The Project area include generally rolling to flat terrain, prairie potholes, and some additional topography along drainages. Elevations range from approximately 366 to 540 meters (m) (1,201 to 1,771 feet [ft]). Raptor nest surveys focused on visible wooded areas within the Project area.

2.0 METHODS

The raptor and large bird nest survey was conducted via a vehicle on public roads from May 27-30, 2017. The survey focused on the identified nest locations from the 2016 raptor nest surveys (WEST, 2016) within the Project area and incidental observation of any new nests for the 2017 breeding season.

One Burns & McDonnell wildlife biologist, equipped with binoculars, GPS unit, tablet with ArcGIS capabilities, maps, etc., observed stick nests during the survey period. The biologist conducted the surveys from approximately 7:30 AM to 7:00 PM each day. The weather conditions were mild and clear allowing for full range of visibility. The nest locations (Figure A-1, Appendix A) were estimated from public roadways using a sub-meter accurate global positioning system (GPS) unit and recorded on a tablet computer. Stick nests were identified based upon the size, general composition, and structure of the nest.

Determinations of stick nest activity after tree leaf-out is difficult because of severely limited visibility. A classification of “inactive” may not be accurate due to the visibility of the nest or surrounding limbs. Reasonable efforts were made to determine if a stick nest was active by observation of chicks or adults on the nest, or in adjacent limbs. Observations of eggs within nest was not possible due to land access and the height of nests.

Data recorded for each observed nest included:

- Nest identification numbering, when possible
- Species occupying the nest, if reasonably possible to determine
- Nest status (i.e., unoccupied, occupied, number of individuals present), if reasonably possible to determine
- Nest condition, if possible
- Nest substrate, if possible
- Nest location in latitude and longitude

3.0 RESULTS

The 2016 survey efforts that were completed March 28-April 1, and 15 stick nests were documented in the Project area (WEST, 2016). Identification of nests as well as species usage and activity (if determinations were possible) are included in Appendix B. A total of 19 stick nests were documented in the Project area during the May 2017 survey (Figure A-1, Appendix A; Appendix B). Within these observations, 13 of the nests were in approximate locations previously documented by survey efforts completed in 2016 (WEST, 2016). Within the 19 observed nests, 7 nests were determined to be active and 12 nests were either inactive/unable to be determined.

Nest identification numbering for locations where nests were observed in 2016 and 2017 were not able to be correlated between survey years. However, the latitude and longitudes between years can be approximated between the survey years (Appendix B). New locations for observed nests during the 2017 survey included nest numbering following a “2017##” system (Appendix B).

No bald eagle nests were observed within the Project area. No Federal- or State-listed threatened or endangered species were documented during this survey effort.

4.0 DISCUSSION

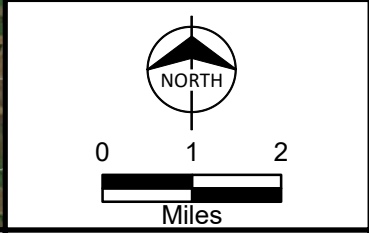
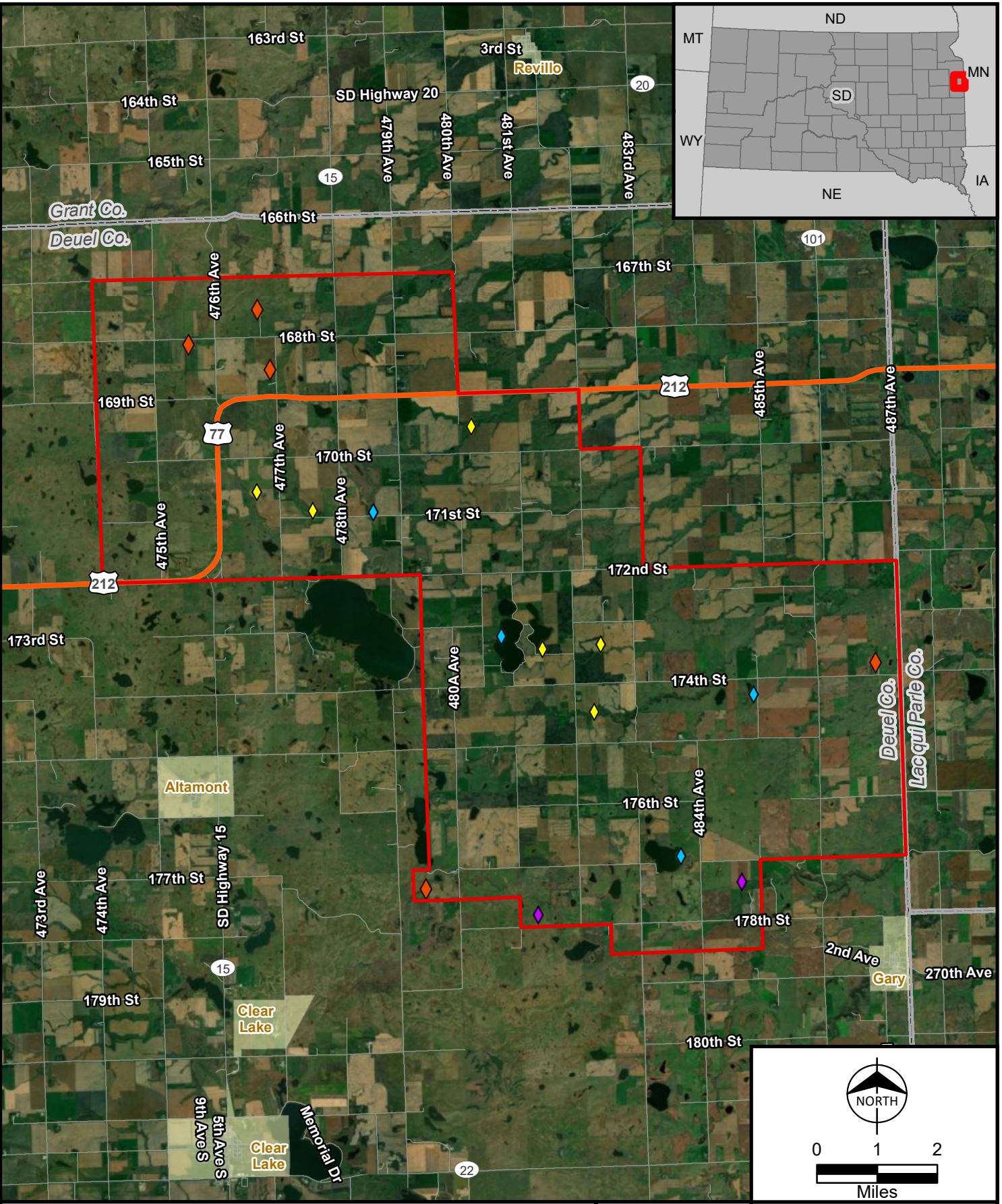
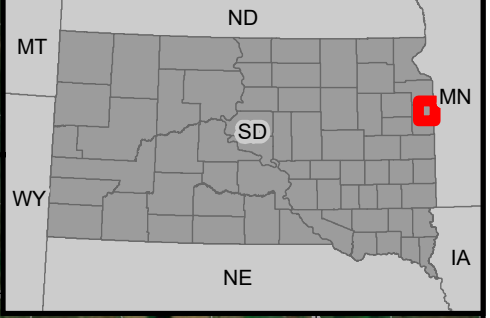
Burns & McDonnell conducted a ground-based avian stick nest survey of the Project area to attempt to inventory the existing stick nests and to determine if each nest is active or inactive, to the extent practicable. A total of 19 raptor nests were found within the Project area. Within the 19 observed nests, 7 nests were determined to be active and 12 nests were either inactive/unable to be determined. No bald eagle nests were observed within the Project area. No Federal- or State-listed threatened or endangered species were documented during this survey effort.

5.0 REFERENCES

- U.S. Environmental Protection Agency. (2017). Level III and IV Ecoregions of North Dakota and South Dakota. USEPA, Corvallis, Oregon. Available online at <https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states>.
- U.S. Fish and Wildlife Service. (2013). Eagle Conservation Plan Guidance. Module 1 – Land Based Wind Energy. Version 2. Division of Migratory Bird Management, USFWS. April 2013. Available online at: <https://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance.pdf>.
- Western EcoSystems Technology, Inc. (2016). Raptor Nest Survey Deuel County Wind Energy Project, Deuel County, South Dakota. Draft Report: March 28 – April 1, 2016. Prepared for Deuel Wind Energy LLC, Chicago, Illinois. Prepared by Western EcoSystems Technology, Inc. (WEST), Bismarck, North Dakota. November 14, 2016. 9 pages + appendix.

APPENDIX A - FIGURES

Path: Z:\Clients\ENS\Invenergy\99578_Deuel\Avian\Studies\Geospatial\DataFiles\ArcDocs\Nest Survey\99578_Invenergy_Avian_8pfsx11_North.mxd jmaine 11/21/2018
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<p>Unidentified Raptor Nest</p> <ul style="list-style-type: none"> ◆ Unknown Size Raptor Nest (Observed 2016 & 2017) ◆ Medium Raptor Nest (Observed 2016 & 2017) ◆ Medium Raptor Nest (Observed 2017) 	<p>Red-tailed Hawk Nest</p> <ul style="list-style-type: none"> ◆ Observed 2016 & 2017 	<ul style="list-style-type: none"> Highway Road Municipality County
<p> Project Area</p>		



Figure A-1
 Nest Survey
 Deuel Harvest North Wind Farm
 Deuel Harvest Wind Energy, LLC
 Deuel County, South Dakota

APPENDIX B – RAPTOR NEST OBSERVATION TABLE

Table B-1: Raptor Stick Nests Identified in the Deuel Harvest North Project Area in 2017

Nest Identification Number	Latitude	Longitude	Species Common Name	Nest Type	Notes	Status
166*	44.80761	-96.5759	Unidentified raptor	Stick/Medium		Inactive/Unable to Determine
171*	44.81412	-96.507	Unidentified raptor	Stick/Medium		Inactive/Unable to Determine
172*	44.8147	-96.6136	Red-tailed hawk	Stick/Medium	Adult on nest	Active
236*	44.856	-96.555	Unidentified raptor	Stick		Inactive/Unable to Determine
238*	44.86579	-96.4597	Red-tailed hawk	Stick	Adult on nest	Active
239*	44.87214	-96.5521	Unidentified raptor	Stick		Inactive/Unable to Determine
240*	44.87139	-96.5719	Unidentified raptor	Stick	Adult on nest	Active
243*	44.90621	-96.648	Unidentified raptor	Stick		Inactive/Unable to Determine
244*	44.91116	-96.6668	Unidentified raptor	Stick		Inactive/Unable to Determine
245*	44.9254	-96.5937	Unidentified raptor	Stick		Inactive/Unable to Determine
246*	44.94049	-96.661	Unidentified raptor	Stick		Inactive/Unable to Determine
247*	44.947	-96.6884	Unidentified raptor	Stick		Inactive/Unable to Determine
248*	44.95481	-96.6648	Unidentified raptor	Stick		Inactive/Unable to Determine
201701	44.63786	-96.7007	Red-tailed hawk	Stick/Medium	Adult on nest	Active
201702	44.60379	-96.5964	Red-tailed hawk	Stick/Medium	Adult/juvenile on nest	Active
201703	44.64753	-96.5577	Red-tailed hawk	Stick/Medium	Adult on nest	Active
201704	44.68148	-96.6384	Unidentified raptor	Stick/Medium		Inactive/Unable to Determine
201705	44.69706	-96.5724	Red-tailed hawk	Stick/Medium	Adult/juvenile on nest	Active
201706	44.68043	-96.5568	Unidentified raptor	Stick/Medium		Inactive/Unable to Determine

* Nest Identification Number from WEST, 2016.



CREATE AMAZING.

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