



TO: NextEra Energy Resources, LLC
FROM: Tetra Tech
DATE: 2/17/2016
CORRES. NO.: TTCES-PTLD-2016-004
SUBJECT: Brady Wind Energy Center Raptor Nest Survey Report

Introduction

Brady Wind, LLC (Brady Wind), a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC (NextEra) is developing the Brady Wind Energy Center (Project) located in Stark County, North Dakota (Figure 1). Brady Wind is committed to environmental due diligence and has contracted Tetra Tech, Inc. (Tetra Tech) to conduct raptor nest surveys in the Project Area and vicinity.

There are two known bald eagle nests within 10 miles of the Project Area. The nests were located by Tetra Tech during spring 2015 aerial raptor nest surveys conducted in support of another proposed wind energy facility (now canceled). The nearest bald eagle nest is located approximately three miles to the east of the Project Area in an isolated stand of trees surrounded by agricultural habitat. The other bald eagle nest is located approximately 8.5 miles to the northeast of the Project Area, along the Heart River. Both nests were occupied in April 2015.

Tetra Tech requested locations of documented eagle nests within a 10-mile radius of the Project Area in May 2015 from North Dakota Game and Fish (NDGF). NDGF reported six historic golden eagle nest structures all located on sandstone buttes, approximately 8 to 9 miles northwest of the Project Area (Figure 2), possibly indicating one to two territories based on spacing of the nests.

The objective of the raptor nest surveys was to document all raptor nests within the Project Area plus a 2-mile buffer and all eagle nests within a 10-mile buffer of the Project Area. Tetra Tech used standardized protocols for the raptor nest surveys that were designed to be responsive to the level of effort recommended in Tier 3 of the voluntary Land-Based Wind Energy Guidelines (WEG; USFWS 2012) and Stage 2 of the Eagle Conservation Plan Guidance (ECP Guidance; USFWS 2013). This report describes raptor nest surveys conducted in summer and fall 2015 (June and November) and winter 2016 (January).

Data Collection

To aid in navigation and data recording, topographic maps, and electronic tablets, and hand-held global positioning system (GPS) devices were used during the surveys. An optically stabilized camera was used to photograph nests. If a nest was found, the following data were collected:

- **Nest Identification Number:** corresponding with GPS waypoint number.
- **Raptor Species:** Using four-letter American Ornithologists' Union codes (e.g., RTHA = red-tailed hawk, UNKN = unknown species).
- **Adult Present:** On = bird sitting on nest, NEAR = bird near the nest, UNK = Unknown
- **Eggs or Young:** Number of eggs or young observed.
- **Nest Substrate:** Structure in which nest was located (e.g., broadleaf tree, cut bank, transmission pole, etc.).
- **Nest Height:** Height relative to the structure it is on (e.g., on top of transmission pole, $\frac{3}{4}$ of height of tree).

Nest Status: To assess nest status, the following criteria were used (Postupalsky 1974, USFWS 2013):

- **Occupied:** nest containing eggs, young, or an adult sitting on the nest indicating incubation or brooding. Also, a nest not containing eggs or young but showing evidence of use in the survey year such as fresh lining, droppings, feathers on or underneath, or adults near the nest (i.e., in tree) but not sitting on the nest.
- **Unoccupied:** nest showing no evidence of use and no adults present at the nest.

Nest Condition: To assess nest condition, the following criteria were used (Postupalsky 1974, USFWS 2013):

- **Excellent:** defined cup or nest bowl with a well-maintained rim; adult or young present.
- **Good:** nest bowl intact and rim defined; minor repair needed for nest to be used; margins of nest in loose configuration, minor slumping occurring.
- **Fair:** nest bowl intact and nest not dilapidated; but needs significant repair in order to be used; material is slumping or sliding.
- **Poor:** loose structure of nest bowl still present; nest walls and side falling out; nest is in need of major repair to be used.
- **Remnant:** nest bowl not defined; scant material remaining and not usable unless fully rebuilt.

Summer and Fall 2015 Raptor Nest Surveys

The objective of the summer and fall surveys was to document the location of any raptor nest structures within 2 miles of the Project Area to facilitate planning for the avoidance of nest disturbance during construction. Tetra Tech conducted an initial summer ground-based survey on June 10-11, 2015. The survey was conducted from public roadways by a local field biologist equipped with a spotting scope.

A follow-up fall aerial raptor nest survey was conducted on November 17-18, 2015, during the non-breeding season, after trees had dropped their leaves which increased visibility of raptor nests (Tetra Tech 2015). The aerial survey objective was to locate all raptor nests within the Brady Project Area, plus a 2-mile buffer; however, after detecting several large stick nests (consistent with golden eagle nests) on buttes slightly beyond the 2-mile buffer (see below), the search effort was expanded after the surveyors completed nest searches within the 2-mile buffer. The expanded search effort focused exclusively on buttes to the south and east that were within 10 miles of the Project Area in order to determine whether there were suitable nesting ledges, as observed on local buttes with known golden eagle nests. The aerial survey was conducted from a Bell-206 Jet Ranger helicopter (Double M Helicopters, Mandan, North Dakota) that was flown approximately 200 feet above ground level at an approximate speed of 60 miles per hour. The crew consisted of a Tetra Tech biologist, a local field biologist, and pilot. Surveyors primarily focused on potentially suitable nesting habitat on buttes and any large trees sufficient to support nesting by large raptors.

Eagle nests and large stick nests

No bald or golden eagle nests were found within the Project Area or 2-mile buffer surrounding the Project Area during the summer or fall raptor nest surveys. Beyond the 2-mile buffer surrounding the Project Area, there six large unoccupied nests located during the fall aerial raptor nest survey; a cluster of five nests (2015_11, 2015_12, 2015_13, 2015_14, and 2015_15) located 2.1 to 3.2 miles to the northwest of the Project Area and a single nest (2015_18) located 5.9 miles to the northwest of the Project Area (Figure 2; Table 1). The nests were all located on the ledges of sandstone buttes and the nest spacing indicates that there may be one to two territories. These large nests are most likely to be used by large raptor species such as golden eagles or ferruginous hawks, and a golden eagle was subsequently viewed perching in proximity to the cluster of five large unoccupied nests. No additional nests or suitable nesting ledges were found on the buttes visited during the expanded search effort.

Other raptor nests and small stick nests

Other raptor nests detected within the Project Area during the summer and fall raptor nest surveys included five occupied Swainson's hawk nests, one occupied red-tailed hawk nest and six unoccupied small stick nests within the Project Area (Table 2). Outside the Project Area but within 2-miles of the Project Area Tetra Tech detected two occupied Swainson's hawk nests, two occupied red-tailed hawk nests, and 13 unoccupied small stick nests (species unknown). The unoccupied small stick nests were all located in trees and are most likely used by smaller raptor species (e.g., red-tailed hawk and Swainson's hawk). Eleven of the small stick nests located within 2 miles of the Project Area in summer were determined in November 2015 to have been destroyed by the wind (Table 2). These nests are not depicted in this report because they were no longer present by the time of the winter 2016 surveys (Figure 2).

Winter 2016 Raptor Nest Surveys

Golden eagles have been observed displaying courtship behavior as early as January in North Dakota (K. Shelley, USFWS, personal communication, December 16, 2015). In order to detect any early-season occupancy of eagle territories, Tetra Tech conducted an aerial raptor nest survey on January 25-27, 2016, as recommended by USFWS. The aerial survey consisted of searches for all raptor nests within the Project Area plus a 2-mile buffer and searches for eagle nests within the 10-miles of the Project Area. Surveyors also checked the status of previously documented raptor nests, including all known nests within 2 miles of the Project and known bald and golden eagle nests and large stick nests within 10 miles of the Project Area. The same aircraft, crew, and survey approach described for the fall aerial raptor nest surveys was used for the winter aerial raptor nest surveys.

Data collected within the Project Area plus 2-mile buffer included location and status of all stick nests (occupied or unoccupied) and any observations of eagles. Data collected within the remainder of the 10-mile buffer around the Project Area included location and status of any detected eagle nests, potential eagle nests, and any observations of eagles.

Eagle nests and large stick nests

No bald or golden eagle nests were found within the Project Area or 2-mile buffer surrounding the Project Area during the winter raptor nest surveys. Beyond the 2-mile buffer around the Project Area, three of the golden eagle nests reported by NDGF were unoccupied in January 2016 (2015_22, 2015_23, 2015_25; Table 1). These included one (2015_22) which was reported by NDGF as destroyed but surveyors observed a nest in poor condition at the location. Three of the golden eagle nests reported by NDGF were not located (2015_21, 2015_24, and 2015_26; Figure 2, Table 1); Nest 2015_26 was reported as destroyed in the dataset provided by NDGF.). The two groups of large stick nests located on buttes between 2.1 and 5.9 miles from the Project Area (2015_11, 2015_12, 2015_13, 2015_14, 2015_15, and 2015_18; Table 1) were all unoccupied. The two known bald eagle nests located by Tetra Tech in 2015 (2015_19 and 2015_20) were both occupied in January 2016 (Figure 2, Table 1).

Five new large stick nests were found within 10 miles of the Project Area; all five were unoccupied (Figure 2, Table 1). Nest 2016_07 is located on a sandstone pillar in proximity to the golden eagle nests reported by NDGF, approximately 9 miles to the northwest of the Project Area. The other four large stick nests (2016_02, 2016_08, 2016_09, and 2016_10; Table 1) were located in deciduous trees between 3 and 10 miles from the Project Area. Nest 2016_10, is located approximately 800 feet from Nest 2015-20, and is likely an alternate bald eagle nest. Photos of known bald and golden eagle nests and large stick nests within 10 miles of the Project Area are included in Appendix 1.

A total of 7 bald eagles and 18 golden eagles were incidentally observed within 10 miles of the Project Area during the winter raptor nest survey (Figure 2). Eagles of both species were distributed throughout the 10-mile survey area, but outside of the Project Area.

Other raptor nests and small stick nests

There were 17 unoccupied small stick nests within 2 miles of the Project Area; eight within the Project Area and 12 between the Project boundary and the 2-mile buffer (Table 2; Figure 2). Five of these nests were newly documented.

Table 1. Eagle Nests and Large Stick Raptor Nests at Brady Wind Energy Center, North Dakota.									
Nest ID Number	Species	Substrate	Size Category	Status on June 10-11, 2015	Status on November 17-18, 2015	Status on January 25-27, 2016	Distance to Nearest Turbine (miles)	Nearest Turbine	Comments
2015_11	Unknown	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	2.7	4	.
2015_12	Unknown	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	2.8	4	.
2015_13	Unknown	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	2.7	4	.
2015_14	Unknown	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	3.7	4	.
2015_15	Unknown	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	3.9	4	.
2015_18	Unknown	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	6.1	5	.
2015_19	Bald Eagle	Tree	Large	Outside Survey Area	Outside Survey Area	Occupied	9.0	77	Adult perched on empty nest.
2015_20	Bald Eagle	Tree	Large	Outside Survey Area	Outside Survey Area	Occupied	3.2	74	Adult perched in tree adjacent to nest tree.
2015_21	Golden Eagle	Cliff	Large	Outside Survey Area	Outside Survey Area	Not found	9.5	1	NDGF Nest GE099.
2015_22	Golden Eagle	Cliff	Large	Outside Survey Area	Outside Survey Area	Unoccupied	8.5	4	NDGF Nest GE100; reported as destroyed by NDGF but a nest in poor condition was found at the location.
2015_23	Golden Eagle	Cliff	Large	Outside Survey Area	Outside Survey Area	Unoccupied	9.5	1	NDGF Nest GE098.
2015_24	Golden Eagle	Cliff	Large	Outside Survey Area	Outside Survey Area	Not found	9.1	4	NDGF Nest GE101.
2015_25	Golden Eagle	Cliff	Large	Outside Survey Area	Outside Survey Area	Unoccupied	8.6	4	NDGF Nest GE576: extremely tall nest visible from several miles away.
2015_26	Golden Eagle	Cliff	Large	Outside Survey Area	Outside Survey Area	Gone	9.5	1	NDGF Nest GE097; reported as destroyed by NDGF.

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2016_02	Unknown	Tree	Large	Outside Survey Area	Outside Survey Area	Unoccupied	13.3	59	Newly documented in January 2016.
2016_07	Golden Eagle	Cliff	Large	Outside Survey Area	Outside Survey Area	Unoccupied	9.2	1	Newly documented in January 2016. Nest on a sandstone pillar.
2016_08	Unknown	Tree	Large	Outside Survey Area	Outside Survey Area	Unoccupied	8.0	30	Newly documented in January 2016.
2016_09	Unknown	Tree	Large	Outside Survey Area	Outside Survey Area	Unoccupied	12.3	37	Newly documented in January 2016.
2016_10	Unknown	Tree	Large	Outside Survey Area	Outside Survey Area	Unoccupied	3.0	74	Newly documented in January 2016. Located approximately 800 feet from Nest 2015_20; possibly an alternate bald eagle nest.

Table 2. Small Raptor Nests at Brady Wind Energy Center, North Dakota.

Nest ID Number	Species	Substrate	Size Category	Status on June 10-11, 2015	Status on November 17-18, 2015	Status on January 25-27, 2016	Distance to Nearest Turbine (miles)	Nearest Turbine
2015_27	Red-tailed Hawk	Tree	Small	Occupied	Gone	Gone	1.0	8
2015_28	Swainson's Hawk	Tree	Small	Occupied	Gone	Gone	0.5	8
2015_29	Unknown	Tree	Small	Unoccupied	Gone	Gone	1.4	29
2015_30	Swainson's Hawk	Tree	Small	Occupied	Gone	Gone	1.5	31
2015_31	Swainson's Hawk	Tree	Small	Occupied	Gone	Gone	1.1	24
2015_32	Swainson's Hawk	Tree	Small	Occupied	Unoccupied	Gone	0.3	21
2015_33	Swainson's Hawk	Tree	Small	Occupied	Gone	Gone	0.5	43
2015_34	Swainson's Hawk	Tree	Small	Occupied	Gone	Gone	0.9	44
2015_35	Swainson's Hawk	Tree	Small	Occupied	Gone	Gone	1.5	63
2015_36	Red-tailed Hawk	Tree	Small	Occupied	Gone	Gone	1.2	77
2015_37	Unknown	Tree	Small	Unoccupied	Gone	Gone	1.2	73
2015_01	Red-tailed Hawk	Tree	Small	Occupied	Unoccupied	Unoccupied	0.2	68
2015_02	Unknown	Tree	Small	Unknown	Unoccupied	Unoccupied	0.5	85
2015_03	Unknown	Tree	Small	Unknown	Unoccupied	Unoccupied	0.6	Alt6
2015_04	Unknown	Tree	Small	Unknown	Unoccupied	Unoccupied	0.5	Alt6
2015_05	Unknown	Tree	Small	Unknown	Unoccupied	Unoccupied	1.6	77
2015_06	Unknown	Tree	Small	Unknown	Unoccupied	Unoccupied	1.7	50

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Nest ID Number	Species	Substrate	Size Category	Status on June 10-11, 2015	Status on November 17-18, 2015	Status on January 25-27, 2016	Distance to Nearest Turbine (miles)	Nearest Turbine
2015_07	Unknown	Tree	Small	Unknown	Unoccupied	Unoccupied	1.1	38
2015_08	Unknown	Tree	Small	Unknown	Unoccupied	Not found	0.6	36
2015_09	Unknown	Tree	Small	Unknown	Unoccupied	Unoccupied	1.5	18
2015_10	Unknown	Tree	Small	Unknown	Unoccupied	Unoccupied	2.0	14
2015_16	Unknown	Tree	Small	Unknown	Unoccupied	Unoccupied	0.3	35
2015_17	Unknown	Tree	Small	Unknown	Unoccupied	Unoccupied	0.8	60
2016_01	Unknown	Tree	Small	Unknown	Unknown	Unoccupied	1.4	87
2016_03	Unknown	Tree	Small	Unknown	Unknown	Unoccupied	0.1	70
2016_04	Unknown	Tree	Small	Unknown	Unknown	Unoccupied	1.6	Alt6
2016_05	Unknown	Tree	Small	Unknown	Unknown	Unoccupied	0.2	84
2016_06	Unknown	Tree	Small	Unknown	Unknown	Unoccupied	1.6	Alt6

References

Postupalsky, S. 1974. Raptor reproductive success: some problems with methods, criteria, and terminology. Raptor research report 2: 21-31.

Tetra Tech, Inc. 2015. Fall 2015 Avian Report for the Brady Wind Energy Center, Stark County, North Dakota. Report prepared for NextEra Energy, LLC.

USFWS (United States Fish and Wildlife Service). 2012. Land-based Wind Energy Guidelines. Available online at: http://www.fws.gov/windenergy/docs/WEG_final.pdf

USFWS. 2013. Eagle Conservation Plan Guidance. Module 1 – land-based wind energy, version 2. U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Washington D.C., USA.

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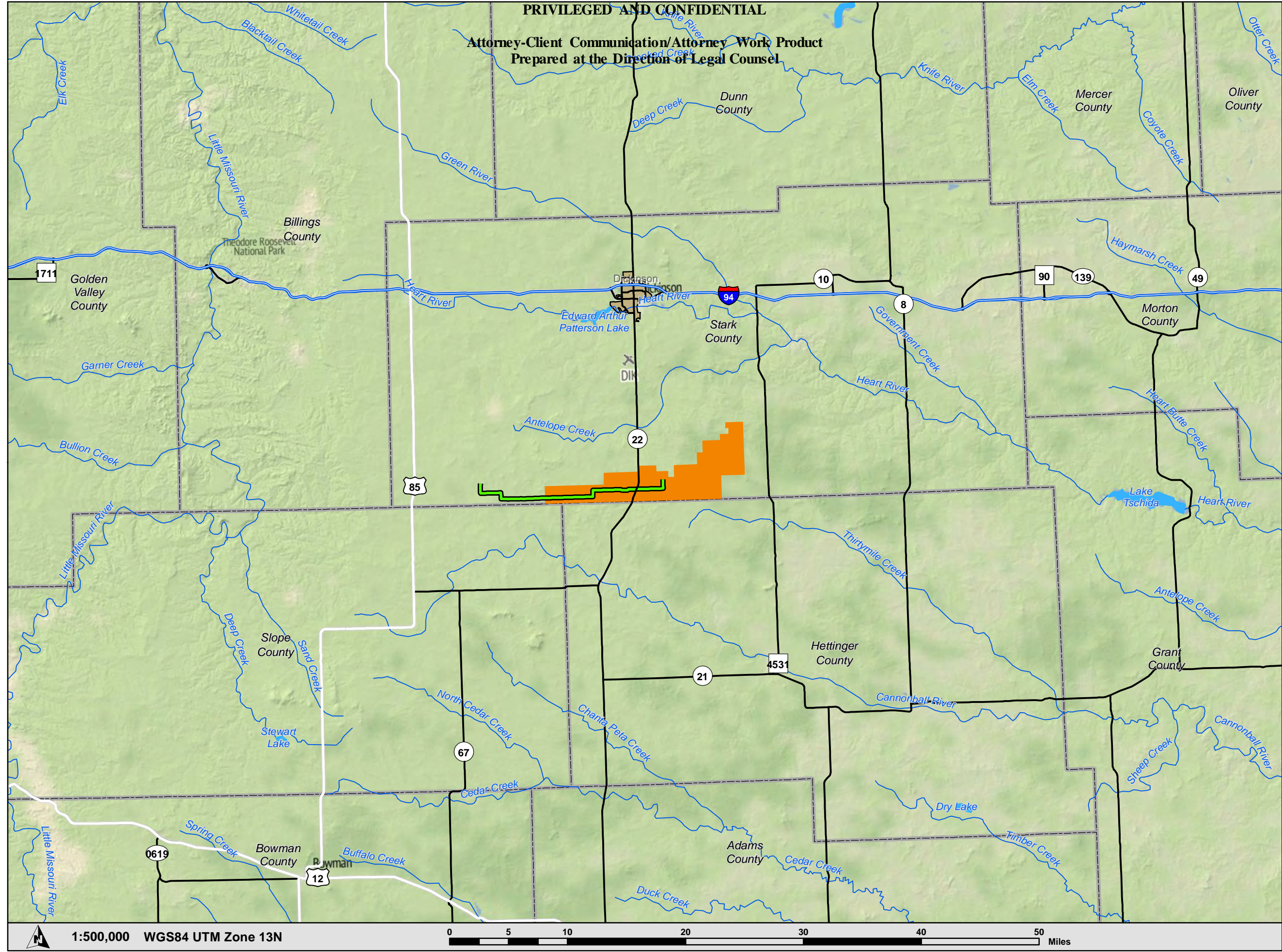


Figure 1

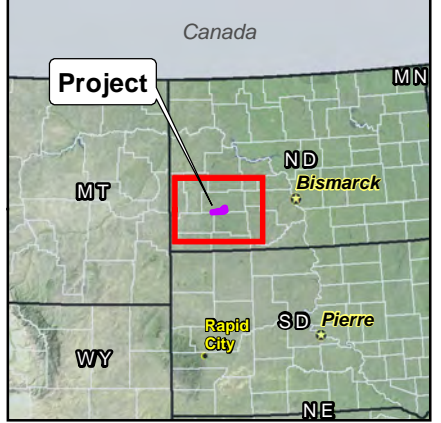
Vicinity Map



Brady Wind Energy Center

Stark County, ND

- Proposed Project Area (10-21-2015)
- Proposed Transmission Line (01-14-2016)
- State Boundary
- County Boundary
- Urban area
- Interstate Highway
- Secondary Highway
- Secondary Road
- River/Stream
- Lake/Pond



1:500,000 WGS84 UTM Zone 13N

0 5 10 20 30 40 50 Miles

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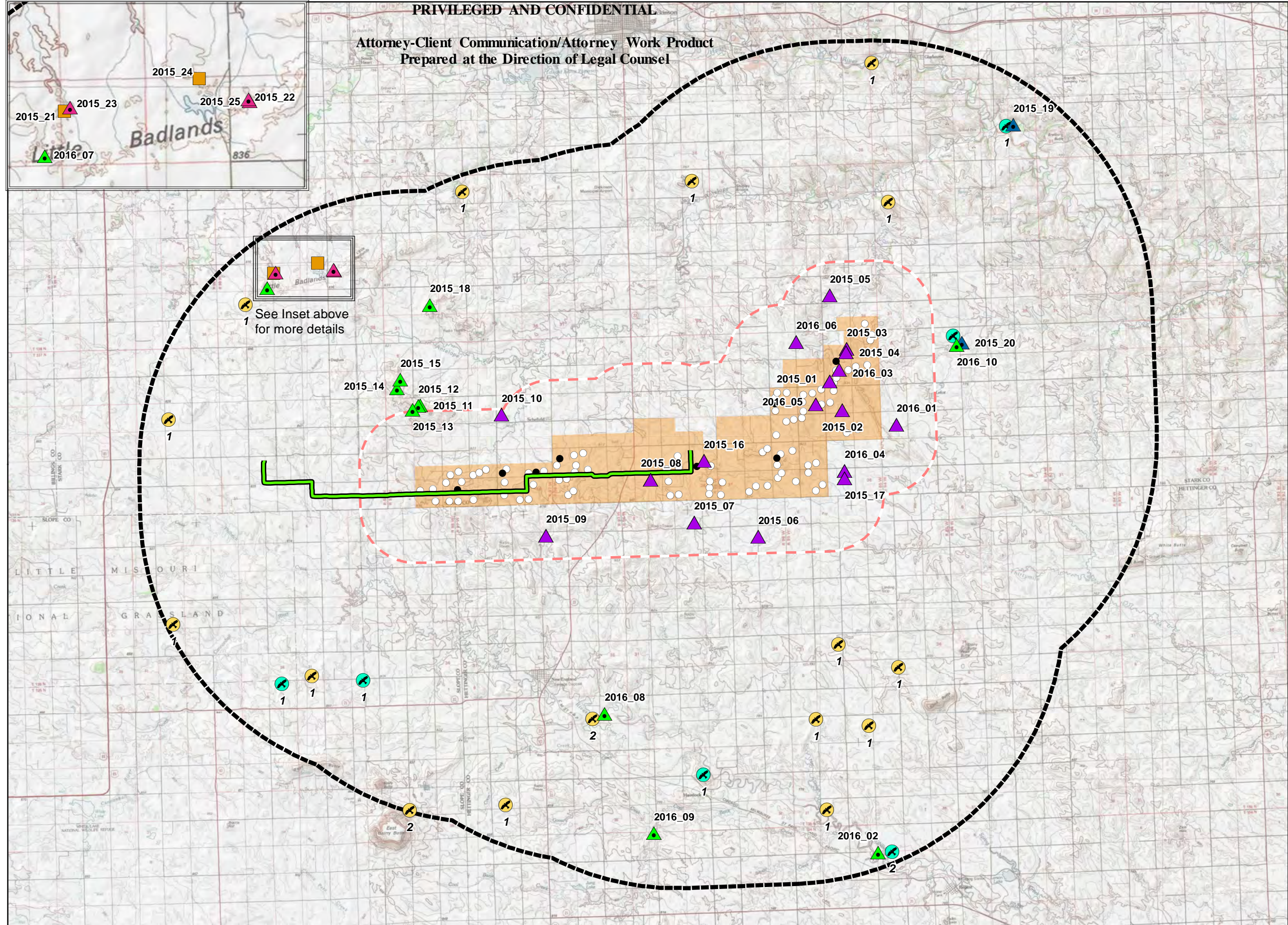


Figure 2

Winter 2016 Raptor Nest
Survey Results



Brady Wind Energy Center

Stark County, ND
Last modified: 02-17-2016

- Occupied bald eagle nest
- Unoccupied golden eagle nest
- Unoccupied large stick nest
- Unoccupied small stick nest
- Historical nest not found during survey
- Bald Eagle Observation
- Golden Eagle Observation
- Proposed Project Area (10-21-2015)
- Proposed Turbine (11-06-2015)
- Proposed Alternate Turbine (11-06-2015)
- Proposed Transmission Line (01-14-2016)
- Survey Area 2-mile Buffer
- Survey Area 10-mile Buffer

1:215,000 WGS84 UTM Zone 13N

0 0.5 1 2 3 4 5 Miles

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Appendix 1

Brady Wind Energy Center January 2016

Raptor Nest Survey Photo Log



Figure 1. Nest 2015_19.



Figure 2. Nest 2015_20.



Figure 3. Nest 2016_10.



Figure 4. Nest 2016_08.



Figure 5. Nest 2016_09.



Figure 6. Nest 2016_02.



Figure 7. Nest 2015_23.



Figure 8. Nest 2015_22.



Figure 9. Nest 2015_25.



Figure 10. Nest 2016_07.



Figure 11. Nest 2015_11.



Figure 12. Nest 2015_12.



Figure 13. Nest 2015_13.



Figure 14. Nest 2015_14.



Figure 15. Nest 2015_15.



Figure 16. Nest 2015_18.