
TO: NextEra Energy Resources, LLC
FROM: Tetra Tech
DATE: 5/6/2016
CORRES. NO.: TTCES-PTLD-2016-047
SUBJECT: Brady II Wind Energy Center Raptor Nest Survey Report

Introduction

Brady Wind II, LLC (Brady Wind II), a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC (NextEra), is developing the Brady II Wind Energy Center (Project) in Hettinger and Stark counties, 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 Study Area identified for the Brady II Wind Energy Center (Figure 1) and a 10-mile buffer surrounding the Study Area (Figure 2).

The objective of the raptor nest surveys was to document all raptor nests within the Study Area plus a 2-mile buffer, and all eagle nests within a 10-mile buffer of the Study 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 fall 2015 (November), winter 2016 (January and February), and spring 2016 (March).

Tetra Tech requested locations of documented eagle nests within the Study Area and a 10-mile buffer around the Study Area in May 2015 and April 2016 from North Dakota Game and Fish (NDGF). In May 2015, NDGF reported two historic golden eagle nest structures, located on sandstone buttes approximately 9 miles northwest of the Study Area (Figure 2). One of these nests (2015_22) was reported as destroyed by NDGF; however, surveyors checked for new nests in the vicinity of this historic nest location during the winter and spring 2016 aerial surveys. In April of 2016, correspondence with NDGF confirmed that a golden eagle nest located during our spring 2016 aerial nest survey had been reported to NDGF. NDGF also confirmed that they had no new information on eagle nests within 10 miles of the Study Area.

In spring of 2015, Tetra Tech located one bald eagle nest within 10 miles of the Study Area during aerial raptor nest surveys conducted in support of another proposed wind energy facility (now canceled). The bald eagle nest is located approximately 8.6 miles to the northeast of the Study Area, in an isolated stand of trees surrounded by agricultural habitat. There were no other known bald or golden eagle nests within a 10-mile radius of the Study Area, prior to Tetra Tech conducting the raptor nest surveys.

Data Collection

To aid in navigation and data recording, topographic maps and electronic tablets with a built in global positioning system (GPS) 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, 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 (e.g., 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.

Fall 2015 Raptor Nest Surveys

The objective of the fall surveys was to document the location of any raptor nest structures within 2 miles of the Study Area to facilitate planning for the avoidance of nest disturbance during construction. An aerial raptor nest survey was conducted on November 17-18, 2015, during the non-breeding season and after trees had dropped their leaves, which increased visibility of raptor nests. The aerial survey objective was to locate all raptor nests within the Study 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 Study 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 a 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 Study Area or the 2-mile buffer surrounding the Study Area during the fall 2015 raptor nest surveys. Beyond the 2-mile buffer surrounding the Study Area, two large unoccupied nests were located in trees (2015_10 and 2015_38) and six large unoccupied nests were located on sandstone buttes. The nests on the sandstone buttes consisted of a cluster of five nests (2015_11, 2015_12, 2015_13, 2015_14, and 2015_15) located 3.8 to 5.0 miles to the northwest of the Study Area, and a single nest (2015_18) located 7.4 miles to the northwest of the Study Area (Figure 2; Table 1). 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 2 miles of the Study Area during the fall raptor nest surveys included seven unoccupied small stick nests (Tables 1 and 2). The unoccupied small stick nests were all located in trees and suspected to have been used by smaller raptor species (e.g., red-tailed hawk and great-horned owl).

Winter 2016 Raptor Nest Surveys

January 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 Study Area plus a 2-mile buffer, and searches for eagle nests within the Study Area plus a 10-mile buffer. Surveyors also checked the status of previously documented raptor nests, including all known nests within 2 miles of the Study Area, and known bald and golden eagle nests and large stick nests within 10 miles of the Study Area. The same aircraft, crew, and survey approach described for the fall aerial raptor nest surveys was used for the January aerial raptor nest surveys.

Data collected within the Study Area plus the 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 Study 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 Study Area or the 2-mile buffer during the January nest surveys. Beyond the 2-mile buffer, the existing golden eagle nest structure reported by NDGF was unoccupied in January 2016 (2015_25; Table 1). Nest 2015_22, which was reported as destroyed in the dataset provided by NDGF, was confirmed to be gone. The two groups of large stick nests located on buttes between 3.8 and 7.4 miles from the Study Area (2015_11, 2015_12, 2015_13, 2015_14, 2015_15, and 2015_18; Table 1) were all unoccupied. The known bald eagle nest located by Tetra Tech in 2015 (2015_20) was occupied in January 2016 (Table 1).

Five new large stick nests were found between the 2-mile and 10-mile buffer around the Study Area (2016_02, 2016_08, 2016_10, 2016_09, and 2016_11); all five nests were unoccupied and located in deciduous trees (Table 1). Nest 2016_10 is located approximately 800 feet from Nest 2015_20, and is likely an alternate bald eagle nest. The other four large stick nests (2016_02, 2016_08, 2016_09, and 2016_11) were located in deciduous trees between 2 and 10 miles from the Study Area.

A total of 9 bald eagles and 15 golden eagles were incidentally observed within 10 miles of the Study Area during the January raptor nest survey. Eagles of both species were distributed throughout the 10-mile survey area, but outside of the Study Area.

Other raptor nests and small stick nests

There were seven unoccupied small stick nests within 2 miles of the Study Area; five within the Study Area and 2 within the 2-mile buffer around the Study Area (Table 2; Figure 2). None of these nests were newly documented.

February 2016 Raptor Nest Surveys

An additional winter aerial raptor nest survey was conducted on 24 February, 2016 to detect any early-season occupancy of eagle territories. The aerial survey consisted of checks of all known and potential bald and golden eagle nests within 10-miles of the Study Area; small raptor nests were not checked during this survey. The same aircraft, crew, and survey approach described for the previous raptor nest surveys was used for the February aerial raptor nest surveys. Data collected during the survey included the status of any confirmed or potential bald and golden eagle nests, the location and status of new potential eagle nests, and any observations of eagles.

Eagle nests and large stick nests

The known bald eagle nest located outside the Study Area which was occupied in January (Nest 2015_20) was still occupied during the February surveys. An adult was observed perched near the nest. All of the known and potential golden eagle nests located on sandstone buttes to the northwest of the Study Area were unoccupied.

Three large stick nests located in trees to the south of the Study Area (2016_08, 2016_09 and 2016_11) were occupied based on the addition of fresh greenery; however, no eagles were observed in attendance at these nests. Two new large stick nests (Nests 2016_12 and 2016_13) were found in the same group of cottonwood trees as Nest 2016_08, and are probably alternate nests. There are often several alternate, inactive nests within an eagle territory. Three eagles (one bald and two golden eagles) were observed incidentally during the survey. All of the eagles were located outside of the Study Area and observed flying individually and at least 0.36 miles from the nearest known large stick nest.

March 2016 Raptor Nest Surveys

Tetra Tech conducted an aerial raptor nest survey on March 29-31, 2016 with the objective of documenting all raptor nests within 2 miles of the Study Area, and all eagle nests within the Study Area plus a 10-mile buffer, following recommendations of the ECP Guidance. Along with searching for all raptor nests within the Study Area plus the associated buffers, surveyors also checked the status of previously documented raptor nests, including all known nests within 2 miles of the Study Area and known bald and golden eagle nests and large stick nests within 10 miles of the Study Area. The same aircraft, crew, and survey approach described for the previous aerial raptor nest surveys was used for the March aerial raptor nest surveys.

Data collected within the Study Area plus the 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 Study 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 eagle nests were located within the Study Area. One occupied golden eagle nest (Nest 2015_39) was found within the 2-mile buffer around the Study Area (Figure 2). The nest is located 0.2 miles to the south of the Study Area boundary. This nest is relatively undersized and located near the top of the tree, which is more typical of a hawk nest than a golden eagle nest. The nest was classified as small and not considered to be a potential eagle nest when first located during the November 2015 surveys and rechecked during the January 2016 surveys. Follow-up ground surveys in April showed nest 2015_39 continued to be occupied.

Three occupied golden eagle nests and one occupied bald eagle nest were found between the 2-mile and 10-mile buffer around the Study Area (Figure 2). The nearest nest is a golden eagle nest (2016_08), located 2.0 miles to the south of the Project Area. All of the other large stick nests located in trees between the 2 and 10-mile buffers around the Study Area were unoccupied. Nests 2016_12 and 2016_13 appear to be alternate nests within the golden eagle territory of Nest_2016_08. Nest 2016_10 appears to be an alternate nest within the bald eagle territory of nest 2016_20. Nests 2016_02 and 2015_38 are located in large trees near drainages and these nest structures appear large enough to potentially support eagles. Nest 2015_10 is large, but appears to be a ferruginous hawk nest based on the height and size of the nest tree.

Two of the large stick nests located on buttes between the 2 and 10-mile buffer around the Study Area (2015_13 and 2015_15) were determined to be occupied based on fresh lining material added to the nests between the February and March surveys. However, no raptors were present and the species could not be determined. Nest 2015_25, which is a historical golden eagle nest location provided by NDGF, was occupied by a ferruginous hawk. All of the other large stick nests located on buttes were unoccupied.

Other raptor nests and small stick nests

Surveyors located three occupied great horned owl nests, one occupied ferruginous hawk nest, one occupied red-tailed hawk nest, and three unoccupied small stick nests within the Study Area during the March 2016 aerial raptor nest surveys (Figure 2). Outside the Study Area, but within the 2-mile buffer, surveyors located two occupied great horned owl nests and one unoccupied small stick nest (Figure 2). All of the unoccupied small stick nests were located in trees and are most likely used by smaller raptor species (e.g., red-tailed hawk and great horned owl). Three of these nests were newly documented.

Table 1. Eagle Nests and Large Stick Raptor Nests at Brady II Wind Energy Center, North Dakota, November 2015-March 2016.

Nest ID Number	Species	Substrate	Size Category	Status on November 17-18, 2015	Status on January 25-27, 2016	Status on February 24, 2016	Status on March 29-31, 2016	Distance to Nearest Turbine (miles)**	Nearest Turbine	Comments
2015_10	Unknown	Tree	Large	Unoccupied	Unoccupied	Not checked	Unoccupied	3.6	5	Nest may have been built up recently as nest size was recorded as small in November. Appears to be a ferruginous hawk nest based on the nest height and size of nest tree.
2015_11	Unknown	Cliff	Large	Unoccupied	Unoccupied	Unoccupied	Unoccupied	4.9	2	
2015_12	Unknown	Cliff	Large	Unoccupied	Unoccupied	Unoccupied	Unoccupied	4.9	2	
2015_13	Unknown	Cliff	Large	Unoccupied	Unoccupied	Unoccupied	Occupied	4.9	2	Fresh lining material in the nest in March, but species undetermined
2015_14	Unknown	Cliff	Large	Unoccupied	Unoccupied	Unoccupied	Unoccupied	5.8	2	
2015_15	Unknown	Cliff	Large	Unoccupied	Unoccupied	Unoccupied	Unoccupied	6	2	Fresh lining material in the nest in March, but species undetermined
2015_18	Unknown	Cliff	Large	Unoccupied	Unoccupied	Unoccupied	Unoccupied	8.1	4	
2015_20	Bald Eagle	Tree	Large	Outside Survey Area	Occupied	Occupied	Occupied	9.9	59	Adult on nest incubating.
2015_22*	Golden Eagle	Cliff	Large	Outside Survey Area	Gone	Gone	Gone*	10.7	2	NDGF Nest GE100; reported as destroyed by NDGF.
2015_25	Ferruginous Hawk	Cliff	Large	Outside Survey Area	Unoccupied	Unoccupied	Occupied	10.7	2	NDGF Nest GE576; extremely tall nest visible from several miles away.
2015_38	Unknown	Tree	Large	Unoccupied	Not found	Not checked	Unoccupied	4.1	5	
2015_39	Golden Eagle	Tree	Small	Unoccupied	Unoccupied	Not checked	Occupied	0.9	54	Not a typical eagle nest, relatively small and located near the top of the tree; resembles a buteo nest. Hence, the nest was not checked during the one day February survey to check occupancy of known or suspected eagle nests.
2016_02	Unknown	Tree	Large	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	9.6	71	
2016_08	Golden Eagle	Tree	Large	Outside Survey Area	Unoccupied	Occupied	Occupied	2.5	49	First found in January; fresh nest lining material in February; adult incubating in March.
2016_09	Golden Eagle	Tree	Large	Outside Survey Area	Unoccupied	Occupied	Occupied	6.9	49	First found in January; fresh nest lining material in February; adult incubating in March.
2016_10	Unknown	Tree	Large	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	9.7	59	Newly documented in January 2016. Located approximately 800 feet from Nest 2015_20; appears to be an alternate bald eagle nest.
2016_11	Golden Eagle	Cliff	Large	Outside Survey Area	Not found	Occupied	Occupied	8.6	All2	First found in January; fresh nest lining material in February; adult incubating in March.
2016_12	Unknown	Tree	Large	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	2.5	49	Alternate nest in same group of trees as Nest 2016_08.
2016_13	Unknown	Tree	Large	Outside Survey Area	Unoccupied	Unoccupied	Unoccupied	2.5	49	Alternate nest in same group of trees as Nest 2016_08.
2016_17	Ferruginous Hawk	Tree	Large	Not found	Not found	Not checked	Occupied	0.4	All4	

*This nest is not included in Figure 2 because it is no longer present.

**The distance to the nearest turbine and nearest turbine number are based on the turbine array dated April 22, 2016.

Table 2. Small Raptor Nests at Brady II Wind Energy Center, North Dakota, November 2015-March 2016.

Nest ID Number	Species	Substrate	Size Category	Status on November 17-18, 2015	Status on January 25-27, 2016	Status on February 24, 2016	Status on March 29-31, 2016	Distance to Nearest Turbine (miles)*	Nearest Turbine
2015_06	Unknown	Tree	Small	Unoccupied	Unoccupied	Not checked	Unoccupied	0.3	56
2015_07	Unknown	Tree	Small	Unoccupied	Unoccupied	Not checked	Unoccupied	0.2	43
2015_09	Great Horned Owl	Tree	Small	Unoccupied	Unoccupied	Not checked	Occupied	0.6	17
2015_16	Unknown	Tree	Small	Unoccupied	Unoccupied	Not checked	Unoccupied	1.6	42
2015_40	Unknown	Tree	Small	Unoccupied	Unoccupied	Not checked	Unoccupied	0.9	62
2015_43	Great Horned Owl	Tree	Small	Unoccupied	Unoccupied	Not checked	Occupied	0.7	30
2015_44	Great Horned Owl	Tree	Small	Unoccupied	Unoccupied	Not checked	Occupied	0.6	36
2016_14	Great Horned Owl	Tree	Small	Unknown	Unknown	Not checked	Occupied	2.4	All2
2016_18	Red-tailed Hawk	Tree	Small	Unknown	Unknown	Unknown	Occupied	0.6	17
2016_19	Great Horned Owl	Tree	Small	Unknown	Unknown	Not checked	Occupied	0.3	48

*The distance to the nearest turbine and nearest turbine number are based on the turbine array dated April 22, 2016.

References

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

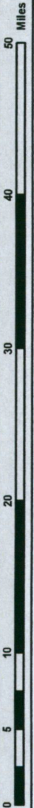
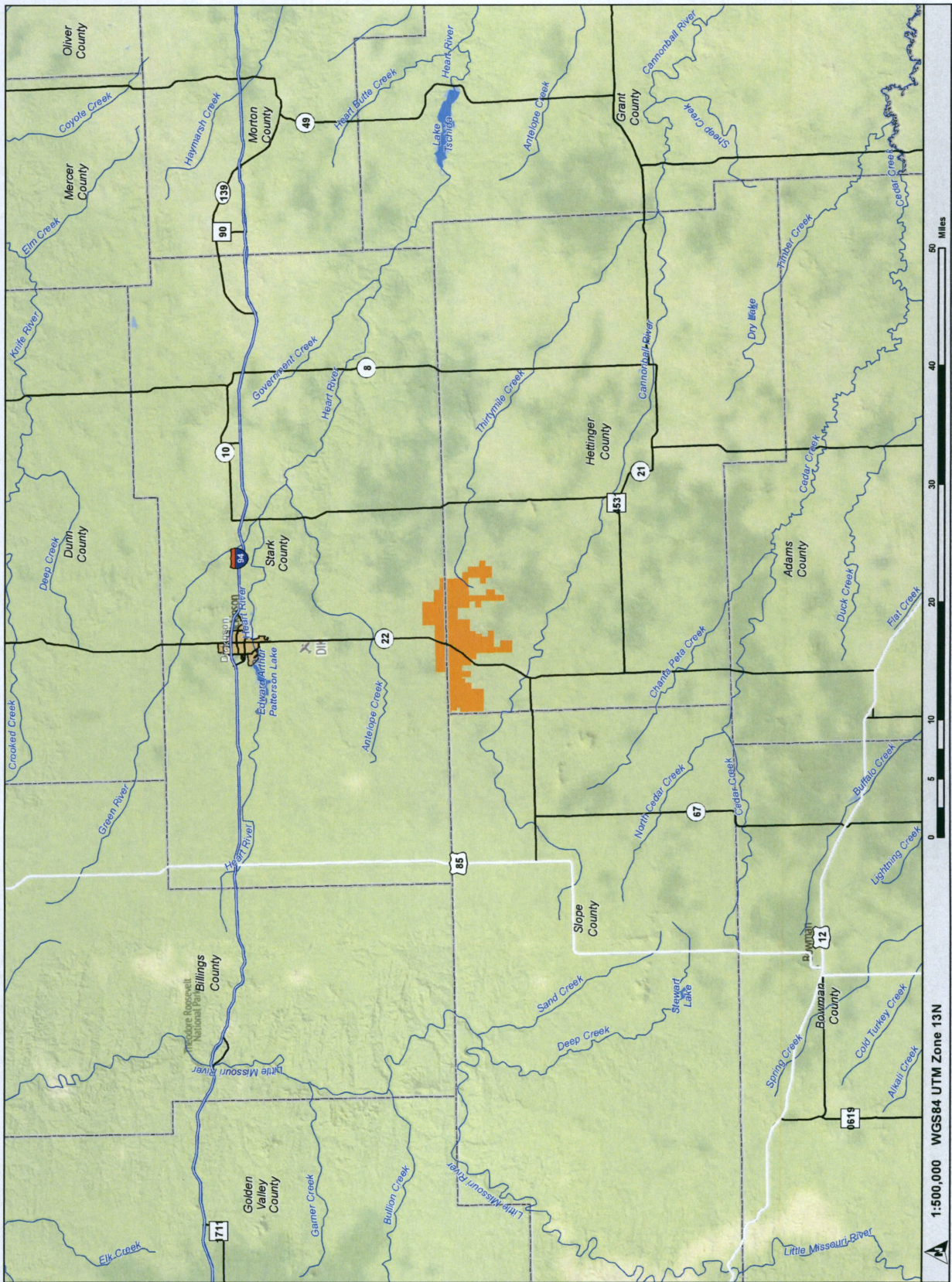
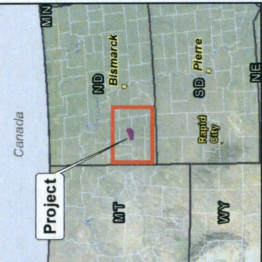
Figure 1

Vicinity Map



Brady II Wind Energy Center
Stark and Hettinger Counties, ND

- State Boundary
- County Boundary
- Urban area
- Interstate Highway
- Secondary Highway
- Secondary Road
- Study Area
- River/Stream
- Lake/Pond



1:500,000 WGS84 UTM Zone 13N

Figure 2

March 2016 Raptor Nest
Survey Results

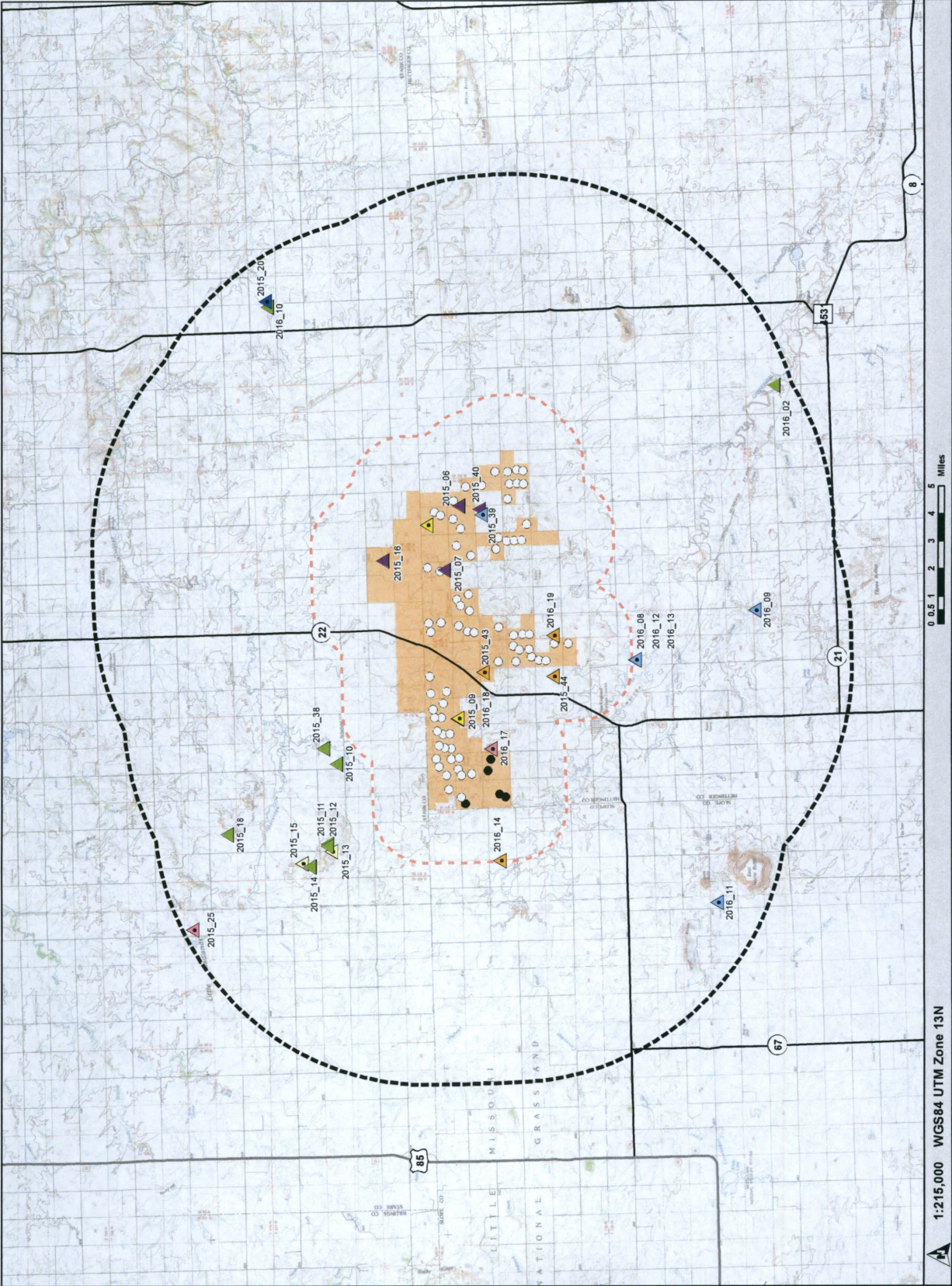


Brady II Wind Energy Center

Stark and Hettinger Counties, ND

- Occupied great horned owl nest
- Occupied ferruginous hawk nest
- Occupied red-tailed hawk nest
- Occupied bald eagle nest
- Occupied golden eagle nest
- Occupied large stick nest, species undetermined*
- Unoccupied large stick nest
- Unoccupied small stick nest
- Proposed Turbine (4-22-16)
- Proposed Alternate Turbine (4-22-16)
- Study Area
- Study Area 2-mile Buffer
- Study Area 10-mile Buffer

* Fresh lining material in the nest.



0 0.5 1 2 3 4 5 Miles

1:215,000 WGS84 UTM Zone 13N