CROWLEY | FLECK PLLP
ATTORNEYS

Wade C. Mann
100 West Broadway, Suite 250
P.O. Box 2798
Bismarck, ND 58502-2798
701.223.6585
wmann@crowleyfleck.com

April 27, 2016

Hand Delivery

Mr. Darrell Nitschke
Executive Director
NORTH DAKOTA PUBLIC
SERVICE COMMISSION
600 E. Boulevard Avenue, Dept. 408
Bismarck, ND 58505-0480

In re: Oliver Wind III, LLC
Case Nos. PU-16-122 and PU-16-123
Our File No. 35-218-029

Dear Mr. Nitschke:

Please find enclosed for filing eleven copies of the bat acoustic survey report in the captioned cases.

Please let me know if you have any questions. Thank you.

Sincerely,

Wade C. Mann

WCM/lh
enc.

cc: Sara Cardwell (via email)
Mitchell D. Armstrong (via email)
Brian Schmidt (via email)
Patrick J. Ward (via email)

28 PU-16-123 Filed 04/27/2016 Pages: 36
Bat Acoustic Survey Report
Oliver Wind III, LLC
Wade Mann, Crowley Fleck, PLLP

28 PU-16-122 Filed 04/27/2016 Pages: 36
Bat Acoustic Survey Report
Oliver Wind III, LLC
Wade Mann, Crowley Fleck, PLLP

Bat Acoustic Survey Report

Oliver III Wind Energy Center

Morton and Oliver Counties, North Dakota

Prepared for:

Oliver Wind III, LLC

NEXTera ENERGY RESOURCES

April 2016

TETRA TECH

This page intentionally left blank

Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 INTRODUCTION

Oliver Wind III, LLC (Oliver Wind III), an indirect, wholly-owned subsidiary of NextEra Energy Resources, LLC, is proposing to develop the Oliver III Wind Energy Center (Project) in Morton and Oliver Counties, North Dakota, located in central North Dakota approximately 13 miles northwest of Bismarck (Figure 1). The Project has a proposed nameplate capacity of approximately 100 megawatts (MW) and includes a planned approximately 10-mile, 230-kilovolt (kV) overhead transmission interconnect line. Additional Project facilities include access roads, electrical collection systems and cabling, a collection substation, an operation and maintenance (O&M) building, a construction laydown area, a permanent meteorological tower, and a switchyard.

Oliver Wind III contracted Tetra Tech, Inc. (Tetra Tech) to perform acoustic monitoring surveys for northern long-eared bat (NLEB, *Myotis septentrionalis*) and other bat species in the Project Area during the spring and summer of 2015. This report provides background information on the habitats and bats that occur in the Project Area (Tetra Tech 2015) and the results of the acoustic surveys.

2.0 BACKGROUND

This section summarizes findings from the Oliver III Wind Energy Center Bat Habitat Assessment (Tetra Tech 2015), presents background information on bats of the region, and a discussion of the legal and regulatory framework applicable to bats.

2.1 Habitat Assessment

Prior to acoustic surveys, Tetra Tech conducted a desktop habitat assessment to evaluate habitat features in the Project Area and a 1.5-mile buffer for suitability for bats with a special focus on NLEB. Tetra Tech considered the suitability of the habitats within the Project Area plus a 1.5-mile buffer to develop the list of species expected to occur in the Project Area and vicinity. The results of that assessment indicated that there was little suitable roosting or foraging habitat for NLEB in the Project Area. Mature forest habitat with greater than 50 percent canopy coverage, preferred by NLEB, is limited in the Project Area (USFWS 2015a). Less than two percent of the 21,881-acre Project Area is forested. Forested habitat in the Project Area is confined to small disconnected woodlots that are distributed within riparian areas, as woody wetlands, and as windbreaks along fields or at homesteads. The majority of cover within the Project Area (56.9 percent) and 1.5-mile buffer (47.7 percent) is developed agriculture (cultivated crops). The percentage of suitable bat habitat cover types was similar between the Project Area and the 1.5-mile buffer. Suitable bat habitat (open water, emergent herbaceous wetlands, deciduous forest, shrub/scrub, mixed forest, evergreen forest, and woody wetlands) comprises 2.3 percent of the total Project Area and 4.4 percent of the 1.5-mile buffer.

2.2 Bat Species Expected to Occur in the Project Vicinity

Eleven bat species are known to occur in North Dakota (Gullickson n.d.). Of these 11 species, available information about species-specific suitable habitat, known distribution ranges, and documented occurrences indicate that five species (big brown bat [*Eptesicus fuscus*], little brown bat [*Myotis lucifugus*], eastern red bat [*Lasiurus borealis*], hoary bat [*Lasiurus cinereus*], and silver-haired bat [*Lasionycteris noctivagans*]) are expected to have a moderate or high potential to occur within the vicinity of the Project Area. The remaining six species (fringed bat [*Myotis thysanodes*], long-eared bat [*Myotis evotis*], long-legged bat [*Myotis volans*], Townsend's Big eared bat [*Corynorhinus townsendii*], western small-footed bat [*Myotis ciliolabrum*], and NLEB) are expected to have a low potential of occurrence.

Little brown bats are thought to be the most common bat in North Dakota (Gullickson n.d.) In addition, big brown bats are known to forage in agricultural lands (Whitaker 1995, Rogers et al. 2006). Roosting colonies of big brown bat and little brown bat have a high probability of occurring within the Project Area because of their known association with human-made structures.

Eastern red bat, hoary bat, and silver-haired bat are all tree-roosting species that migrate long distances between summer and winter habitats (Cryan 2003). Roosting habitat of the eastern red bat, hoary bat, and silver-haired bat are all associated with forested areas (Harvey et al. 2011). Each of these species is found in North Dakota from May through September (Cryan and Veilleux 2007). This group of species has a moderate likelihood of occurring in the Project Area, particularly during migration.

The remaining species found in North Dakota (fringed bat, long-eared bat, long-legged bat, western small-footed bat, and NLEB) have a low likelihood of occurrence in the Project Area based upon species range, known habitat associations, and lack of suitable habitats within the Project Area.

The Project Area is within the range of the federally-listed (threatened) NLEB, but outside of the White Nose Syndrome zone (see section 2.3.1.1(Figure 2)). The species' range includes Morton and Oliver Counties (USFWS 2015a, BCI 2014), and it has been detected in Hettinger and Billings Counties (Gilliam and Barnhart 2011, WAPA and USFWS 2015). Few data are available on NLEB in North Dakota, but the species is believed to occur statewide in suitable habitats (Harvey et al. 2011; Gullickson n.d.). Surveys conducted in the summers of 2009, 2010, and 2011 confirmed the presence of NLEB in the Turtle Mountains, Missouri River Valley, and in the Badlands regions (USFWS 2015a). All recorded instances of NLEB in the Dakotas have been in ecoregions with more topographic relief and trees than the Missouri Plateau ecoregion of the Project Area. Recent amendments to distribution maps identify the primary range occurring in the Turtle Mountains, the Badlands, and along the Missouri River (NDGF 2015). NLEB is expected to have a low likelihood of occurrence within the Project Area during the summer residency period and during migration.

2.3 Regulatory Framework

2.3.1 Federal Protection

Of the 45 species of bats known to occur in the continental United States, eight species are currently federally listed as endangered and protected under the Endangered Species Act (ESA; USFWS 2015b): gray bat (*Myotis grisescens*), Indiana bat (M. *sodalis*), Florida bonneted bat (*Eumops floridanus*), Ozark big-eared bat (*Corynorhinus townsendii ingens*), Virginia big-eared bat (*C. t. virginianus*), lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*), Mexican long-nosed bat (L. *nivalis*) and NLEB. The NLEB is the only bat species listed under the ESA that occurs in North Dakota.

2.3.1.1 Northern Long-eared Bat

On April 2, 2015, the U.S. Fish and Wildlife Service (USFWS) announced that the NLEB was listed as threatened with an interim Section 4(d) rule. The intent of the 4(d) rule is to provide the USFWS flexibility in implementing the ESA by modifying regulations necessary to provide for the conservation of a threatened species while not overburdening private landowners, state agencies, and others with blanket regulations that do not further the conservation of the species. The final 4(d) rule was released on January 14, 2016 (USFWS 2016a). The USFWS determined that White-Nose Syndrome (WNS) is the primary threat to NLEB and regulating other sources of mortality or harm, such as from habitat loss, will not effectively conserve this species. The final rule reduces the scope of incidental take of NLEB (USFWS 2016a), but protocols for implementing the rule are still being developed by USFWS Field Offices.

The final 4(d) rule prohibits all *purposeful take*[1] within the range of NLEB except: removal of NLEB from human structures, defense of human health (disease monitoring), or removal of hazardous trees for the protection of human life and property. All take incidental to otherwise lawful activities is allowed outside of the WNS zone designated by USFWS. The WNS zone includes all counties affected by WNS and an additional 150-mile buffer around these counties (Figure 2; USFWS 2016b).

For areas within the WNS zone, *incidental take*[2] is prohibited only if it 1) occurs within a hibernaculum, 2) if tree removal activities occur within a quarter-mile of a known, occupied hibernaculum at any time of the year or 3) occurs within 150 feet of a known, occupied maternity roost tree from June 1 through July 31 (USFWS 2016a).

---

[1] "Purposeful take is when the reason for the activity or action is to conduct some form of take. For instance, conducting a research project that includes collecting and putting bands on bats is a form of purposeful take. Intentionally killing or harming bats is also purposeful take and is prohibited" (USFWS 2016c).

[2] "Incidental take is defined by the Endangered Species Act as take that is incidental to, and not the purpose of the carrying out of an otherwise lawful activity. For example, harvesting trees can kill bats that are roosting in the trees, but the purpose of the activity is not to kill bats" (USFWS 2016c).

Under the final 4(d) rule, incidental take by wind turbines is not prohibited. Regulatory mechanisms for wind energy facilities were not included in the final 4(d) rule because the primary factor causing the rapid population decline in NLEB is WNS and the best available information suggests that NLEB fatalities caused by wind facilities are not contributing significantly to the species' decline. However, because harm to individual bats by turbines may occur, the USFWS recommends adopting voluntary protocols for best management practices, such as limiting operations of turbines in low-wind speed conditions during the fall bat migration season, to reduce impacts to bats (USFWS 2016a). The Project Area is outside of WNS zone and therefore no forms of incidental take are prohibited; however, this may change in the future if new occurrences of WNS are discovered. The USFWS database and WNS Zone Map is updated on a monthly basis[3] (Figure 2).

2.3.2 State Protection

The protection and regulation of bat species not listed under the federal ESA is typically at the discretion of state wildlife agencies. North Dakota does not have a state endangered or threatened species list, but the North Dakota Game and Fish (NDGF) has identified 100 species of conservation priority, or those in greatest need of conservation in the state (Dyke 2014).

Species are categorized into three levels according to conservation need:

- Level I – species in greatest need of conservation;
- Level II – species in need of conservation, but have had support from other wildlife programs; and
- Level III – species in moderate need of conservation, but are believed to be on the edge of their range in North Dakota.

There are four bat species on the conservation priority list categorized as Level I: big brown bat, little brown bat, Townsend's big-eared bat, and NLEB. Big brown bat and little brown bat are common throughout the state, whereas Townsend's big-eared bat and NLEB are considered to be on the western edge of their ranges, and are rare in the state.

There are no bat species on the conservation priority list categorized as Level II.

There are three bat species on the conservation priority list categorized as Level III: western small-footed bat, long-eared bat, and long-legged bat. These species are known to occur in western North Dakota (NDGF 2015).

The North Dakota State Wildlife Action Plan was updated and released in the fall of 2015 by NDGF. The Project is located within the Missouri River System/Breaks Focus Area which was

[3] http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf

identified as a Focus Area for conservation efforts. Mammal species including the NLEB, western small-footed bat, long-legged bat, long-eared bat, little brown bat, and big brown bat are identified as Species of Conservation Priority within the Missouri River System/Breaks Focus Area (NDGF 2015). Based on species distribution and habitat preferences, all species except the little brown bat and big brown bat have a low likelihood of occurrence in the Project Area.

3.0 ACOUSTIC MONITORING

3.1 Methods

To supplement and refine the Oliver III Wind Energy Center Bat Habitat Assessment (Tetra Tech 2015), Tetra Tech conducted acoustic bat monitoring in the Project Area in summer and fall 2015. The objective of acoustic monitoring was to assess bat use and occurrence of the Project Area by local and migratory bat species. Standardized protocols have been established for pre-construction passive acoustic surveys undertaken to evaluate bat species' risk from wind projects. Tetra Tech designed the acoustic monitoring surveys at the Project Area in accordance with the recommendations outlined within Tier 3 of the voluntary USFWS *Land Based Wind Energy Guidelines* (USFWS 2012) and the *Northern Long-eared Bat Interim Conference and Planning Guidance* for Phase 2 presence/absence surveys (USFWS 2015c).

3.1.1 Acoustic Detectors

Tetra Tech used Wildlife Acoustic Song Meter SM3 Monitoring Systems (bat detectors) for the duration of the acoustic monitoring survey. Each bat detector system consisted of the acoustic detector, powered by a 25-50 watt solar panel and a 12-volt DC battery, encased in a waterproof housing. The SM3-U1 microphone was attached to the recording unit by a high-quality, low-loss 3m microphone cable. Each bat detector was manually checked by trained technicians approximately twice per month during the survey period.

Tetra Tech deployed four ground-based bat detectors within the Project Area in July 2015. Sampling sites were within representative habitats within the Project Area, areas with potential for high bat activity, and areas available for access under existing lease agreements (Figure 3). Site 1 was located between a six acre forested area and a shelter belt; Site 2 was located next to a stock pond amid pastures and cropland; Site 3 was located adjacent to a mature shelter belt near a scrubby one acre patch surrounded by pastures and cropland; and Site 4 was located adjacent to a forested patch near an abandoned farmstead (See Appendix A for photographs of detector locations and habitat descriptions). The microphone height of each of the ground-based bat detectors was approximately2.5 meters. To ensure that the greatest period of bat activity was surveyed, bat detectors were programmed to begin recording at sunset and stop recording approximately at sunrise each day.

The Project Area was continuously surveyed from July 21, 2015, to December 2, 2015, to sample the summer volancy period (when pups can fly; ~3 weeks after birth) and the complete

fall migration periods for the majority of North American bat species, including NLEB. The four bat detectors remained in their designated locations throughout the study period.

3.1.2 Data Quality Assurance and Control

Tetra Tech implemented quality assurance and quality control measures during all stages of data collection, analysis, and report preparation. Bat detector data were downloaded once every month. The incoming echolocation calls were recorded onto high-capacity SD data storage cards, which were then backed up to an external hard drive and sent to a Tetra Tech biologist for analysis. Field biologists submitted data within seven business days, and data were immediately reviewed by the bat biologist to confirm the operational status of the bat detectors.

3.1.3 Data Analysis

All recorded data files were filtered using automated bat call identification software approved by the USFWS (see details below) to identify data files containing potential bat calls[4]. Data were scrubbed and analyzed using Kaleidoscope Pro (Wildlife Acoustics, Inc.) version 3.1.5 and the classifier "Bats of North America 3.1.0" for species of bats in North Dakota. A sensitivity level of "-1 more sensitive/liberal" was used per Wildlife Acoustics and USFWS recommendations (USFWS 2015d). Signals of interest ranged from 8-120 kHz lasting 2–500 ms with a minimum of two call pulses. Full spectrum .wav files were converted to zero-crossing (ZC) using a division ratio of eight.

All calls classified as NLEB were manually reviewed by Tetra Tech in full spectrum format using SonoBat 3.2.0 (SonoBat, Inc.) to confirm the automated classifications. During manual review, Tetra Tech considered a recording as suitable for species level identification if the individual call pulses within the bat pass exhibited the full spectrum of frequency modulation produced by a bat species. Calls that lacked detail to be identified at the species level (e.g., too far from the microphone or noise interference) were identified as "Myotis species" if the call pulses contained characteristics unique to Myotis (i.e., well defined toes) or as "High frequency species" if the frequency center was greater 40 kHz and characteristics between eastern red bat and Myotis were ambiguous. As part of a third party review process, Biodiversity Research Institute (BRI) independently reviewed all calls classified as potential NLEB as well.

SonoBat was chosen for manual review to cross-validate Kaleidoscope Pro classifications with an additional automated bat call ID software program. SonoBat software was used for this step because it has a superior spectrogram platform for reviewing full-spectrum calls.

[4] Each recorded event including a bat vocalization consists of individual "call pulses" that comprise a "bat call sequence" or "bat pass".

3.2 Results

During the 2015 survey, 487 detector-nights (number of nights multiplied by the number of detectors) were sampled over the course of 134 calendar nights between July 21 and December 2, 2015 (Table 1). Three of the four detectors were fully operational during the deployment period. Data gaps occurred at Detector 4 due to delayed deployment and power failures. A total of 3,378 bat call sequences were recorded and identified to the species level, resulting in an overall activity rate of 6.9 bat calls/detector night. Activity rates across all detectors ranged from 5.3 bat calls/detector night to 8.5 bat calls/detector night, with the highest rate occurring at Detector 1 (Table 1).

Table 1. Summary of Acoustic Bat Monitoring Surveys at the Proposed Project

Detector	Level of Effort		Call Sequence Summary		
	Operational Period (2015)	Detector Nights	Total # of Bat Calls	min, max	Mean Activity Rate (bat calls/detector night) (sd)
Detector 1	July 21 - December 2	134	1,144	0, 54	8.5 (11.7)
Detector 2	July 21 - December 2	134	1,027	0, 62	7.6 (12.8)
Detector 3	July 21 - December 2	134	757	0, 62	5.7 (8.9)
Detector 4	July 29 - November 7	85	450	0, 72	5.3 (12.7)
Overall*		**487**	**3,378**	**0, 72**	**6.9 (11.5)**

*Represents cumulative values for detector nights and total number of calls and pooled range and activity rates across all detectors in the Project Area.

3.2.1 Species Presence and Activity Rates

Bat call sequences identified at the species level and included five species and one group (Table 2). Silver-haired bat was the most commonly recorded species (40 percent of the total calls recorded), followed by eastern red bat (25 percent), little brown bat (18 percent), big brown bat (11 percent), and hoary bat (5 percent). During interim analysis of data collected through September, 15 call sequences were auto-classified as potential NLEB by Kaleidoscope Pro v. 3.1.4B. However, during the independent, manual review of call sequences identified as NLEB by Tetra Tech and BRI, the sequences were identified as either little brown bat or as "High Frequency", but not NLEB.

Activity rates were also calculated for each species by detector. Silver haired bat had the highest overall species activity rate with 2.79 calls/detector night (Table 2).

Table 2. Average Activity Rates (Bat Calls/Detector Night) Recorded per Species at Each Detector

Detector	Big brown bat	Eastern red bat	Hoary bat	Silver-haired bat	Little brown bat	High Frequency species
Detector 1	0.9	2.52	0.57	2.96	1.54	0.01
Detector 2	0.87	1.72	0.37	3.40	1.29	0.01
Detector 3	0.73	1.44	0.34	2.25	0.87	0.01
Detector 4	0.53	0.94	0.25	2.41	1.16	0.00
Overall	0.79	1.73	0.40	2.79	1.22	0.01

3.2.2 Timing of Activity

Bat activity remained steady following deployment on July 21 with calls recorded daily through the month of September. Bat activity peaked in early August with 183 calls recorded on the night of August 10 (Figure 4). Several spikes of activity occurred in late August through the middle of September. Activity nearly ceased after several calls were recorded in the first week of October.

Migratory tree bats (silver-haired, hoary, and eastern red bat) accounted for the majority of this activity throughout the duration of the survey period with an even higher proportion of the total activity in September (Figure 5).

Figure 1. Total Number of Calls Recorded by Date at all Detectors

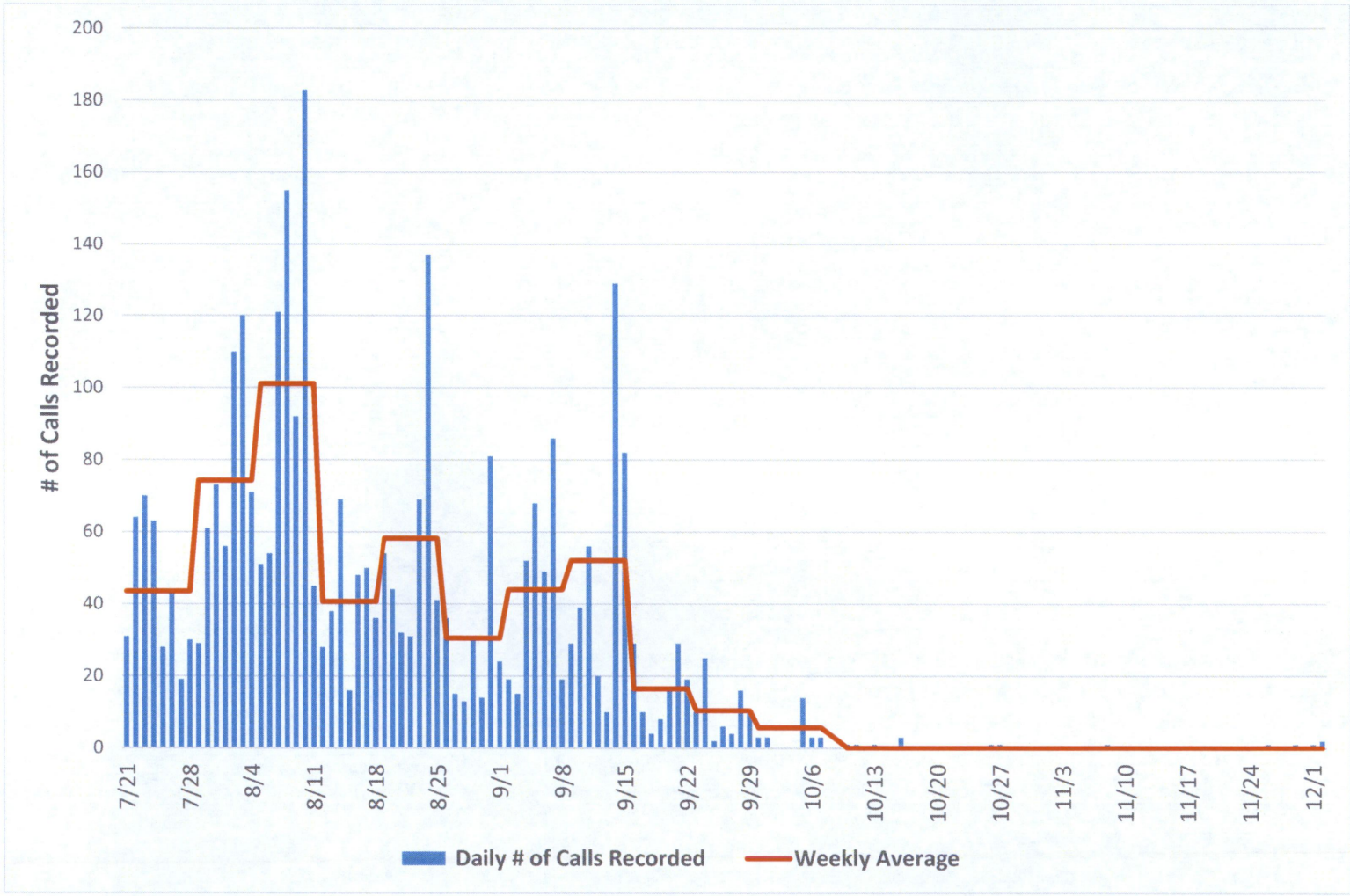
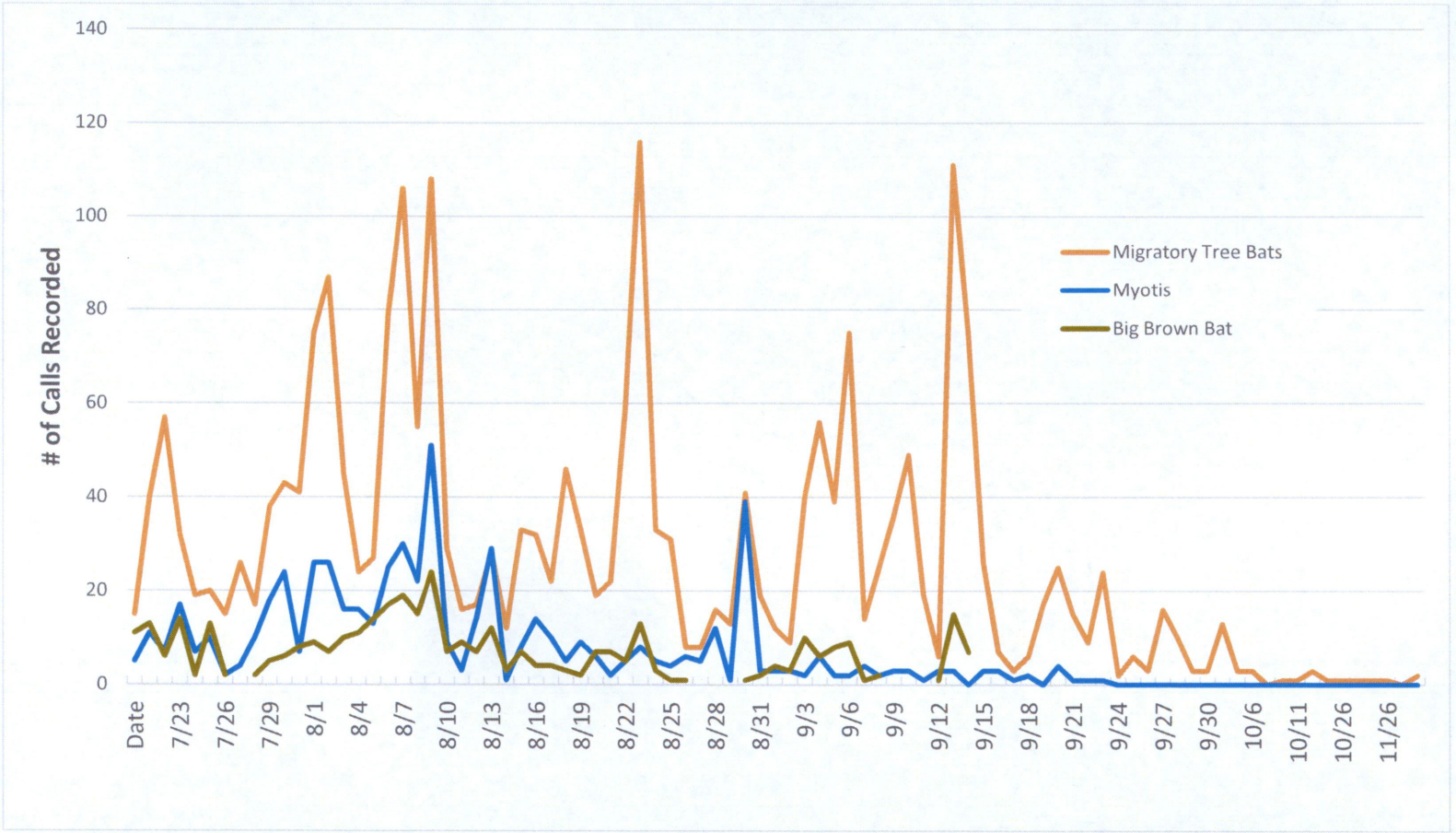


Figure 2. Total Number of Calls Recorded by Date and Species at all Detectors



4.0 DISCUSSION

No NLEB calls were detected during the acoustic survey, likely due to the lack of suitable habitat in the Project Area. More suitable patches of foraging and roosting habitat than those found within the Project Area may be available along Square Butte Creek and the Heart River, but they are beyond distances NLEB are known to travel during foraging forays. Daily movements between roosting and foraging habitats for NLEB are typically less than 1 mile (USFWS 2015a) and home range size varies by sex and site but is generally small (3.5 to 425 acres) (Broders et al. 2006, Owen et al. 2003, Lacki et al. 2009). NLEB roost and forage in forested areas (USFWS 2015a) and the lack of forest cover is likely the limiting factor in the distribution of NLEB in the vicinity of the Project Area.

The highest levels of overall bat activity appeared to be concentrated adjacent to roosting and foraging locations. Several factors influence the relationship between roosts and foraging areas and include variables such as roost type, the availability of roosts, food and water, and species morphology (Kunz and Lumsden 2003). The highest activity was recorded near a six-acre woodlot adjacent to a farm at Site 1 and at Site 2, where a detector was deployed adjacent to a small stock pond. Fewer calls were recorded at the other two sites that were located near small shelterbelts surrounded by cropland and pasture (Appendix A). The Project is located on the fringe of the Missouri River System/Breaks Conservation Focus Area (NDFG 2015), although the Project Area lacks significant waterways and riparian corridors. The nearest include Square Butte Creek and its tributaries, approximately five miles to the north and east and the Heart River, approximately 10 miles to the south. The majority of the Project Area is comprised of marginal bat habitat (i.e., croplands, pasture, and prairie) and lacks forest coverage (Tetra Tech 2015). Treed areas within the Project boundary are primarily limited to woodlots and shelter belts associated with homes and farms and small patches of trees associated with pastures.

The 2015 survey data suggest that bats reside or migrate through the Project Area in August through September and most bats have migrated to local hibernacula or out of region by October. Spikes in activity by migratory tree bats in August and September are suggestive of a migratory events. These findings are consistent with known migration patterns of tree bats in the northern plains (Cryan 2003). Bat migrations within the temperate zone of the United States are common and periods of summer activity become more condensed with increasing latitudes due to time spent in migration (Fleming et al. 2003). The heaviest period of use occurred between August 2 and 10 but it is difficult to determine whether these were summer residents or migrants. Omitting the small number of recordings collected after September, the average activity rate of the Project Area increases to 12.8 calls per detector-night from 6.9 for the full survey period lasting until December.

4.1 Potential Risks Associated with the Proposed Project

To date, no empirical evidence suggests a correlation between pre-construction bat activity (as measured by acoustic monitoring) and post-construction bat mortality (Hein et al. 2013, USFWS 2016a). However, acoustic monitoring provides a relative index of bat activity and provides a list of species that occur within a project area.

Three species of migratory, tree-roosting bats (silver-haired bat, eastern red bat, and hoary bat), were detected throughout the summer period. Pulses in activity by silver-haired and hoary bat in August and September suggest these species may be migrating through the Project Area in brief, episodic movements. The hoary bat, silver-haired bat, and eastern red bat have been regularly documented as fatalities at wind projects across North America, most frequently in later summer and early fall during migratory periods (Arnett et al. 2008, Strickland et al. 2011). The most likely period of potential risk for this group is during migratory periods when individuals are moving across the landscape and are less closely associated with forested areas.

Although the little brown bat is considered the most common bat in North Dakota (Johnson and Isakson 2014), fewer little brown bats were recorded than migratory tree bats. Little brown bat was recorded consistently throughout July and August, which suggests that it is a summer resident species. Lower observations are likely due to the lack a forested riparian areas within the Project Area, which are preferred foraging habitats of little brown bat (Lacki et al. 2007). Fatalities of summer resident species, including little brown bat, have usually been low at wind projects, with the exception of two sites in Canada and Iowa where little brown bats accounted for approximately 25 percent of fatalities (Arnett et al. 2008). Little brown bat does not appear to be the most common species in the Project Area.

No NLEB were detected during the survey but the Project Area is within the species' range and occurrence is possible. The most likely period of potential risk to NLEB is during seasonal movements between winter hibernacula and summer habitats. At present, North Dakota is outside of the WNS buffer zone, therefore all forms of incidental take are exempted from ESA prohibitions under the final 4(d) rule and NLEB are reviewed similar to other non-listed wildlife species in the voluntary Wind Energy Guidelines (USFWS 2012, 2016a).

5.0 LITERATURE CITED

Arnett, E.B., W.K. Brown, W.P. Erickson, K.K. Fiedler, B.L. Hamilton, T.H. Henry, A. Jain, G.D. Johnson, J. Kerns, R.R. Koford, C.P. Nicholson, T.J. O'Connel, M.D. Piorkowski, and R.D. Tankersley, Jr. 2008. Patterns of bat fatalities at wind energy facilities in North America. Journal of Wildlife Management 72:61–78.

Bat Conservation International (BCI). 2014. Species profiles. Available online at http://www.batcon.org/index.php/resources/media-education/species-profiles. Accessed October 2015.

Broders, H.G., G.J. Forbes, S. Woodley, and I.D. Thompson. 2006. Range Extent and Stand Selection for Roosting and Foraging in Forest-Dwelling Northern Long-Eared Bats and Little Brown Bats in the Greater Fundy Ecosystem, New Brunswick. The Journal of Wildlife Management, **70**(5):1174-1184.

Cryan, P.M. 2003. Seasonal distribution of migratory tree bats (*Lasiurus* and *Lasionycteris*) in North America. Journal of Mammalogy 84:579–593.

Cryan, P. M. and J. P. Veilleux. 2007. Migration and use of autumn, winter and spring roosts by tree bats. Pages 153–176 *in* Bats in Forests: Conservation and Management, eds. J. P. H. M.J. Lacki, and A. Kurta. Baltimore, MD, The Johns Hopkins University Press.

Dyke, S. 2014. North Dakota Species of Conservation Priority: 2014 List Update. Available online at: http://gf.nd.gov/magazines/june-2014/north-dakota-species-conservation-priority.

Fleming, T. H., & Eby, P. (2003). Ecology of bat migration. *Bat ecology*, 156-208.

Gilliam, E. and P. Barnhart. 2011. Distribution and habitat use of the bats of North Dakota, Final Report prepared for the North Dakota Game and Fish Department.

Gullickson, G. no date. Bats of North Dakota. North Dakota Game and Fish and Bat Conservation International.

Harvey, M. J., J. S. Altenbach, and T. L. Best. 2011. Bats of the United States and Canada. The Johns Hopkins University Press, Baltimore, MD. USA.

Hein, C.D., J. Gruver, and E.B. Arnett. 2013. Relating Pre-Construction Bat Activity and Post-Construction Bat Fatality to Predict Risk at Wind Energy Facilities: A Synthesis. A report submitted to the National Renewable Energy Laboratory. Bat Conservation International. Austin, TX, USA.

Johnson, S. and Isakson P. 2014. Level 1 Conservation Priority Species. Available online at: http://gf.nd.gov/magazines/north-dakota-species-conservation-priority/level-1 Accessed October 2015.

Kunz, T. H. & Lumsden, L. F. (2003). Ecology of Cativity and Foliage Roosting Bats. *Bat Ecology*, 3-69.

Lacki, M. J., Amelon, S. K., & Baker, M. D. (2007). Foraging ecology of bats in forests. *Bats in forests: conservation and management. Johns Hopkins University Press, Baltimore, Maryland, USA*, 83-127.

Lacki, M.J., D.R. Cox, L.E. Dodd, and M.B. Dickinson. 2009. Response of northern bats (*Myotis septentrionalis*) to prescribed fires in eastern Kentucky forests. Journal of Mammalogy, **90**(5):1165-1175

North Dakota Game and Fish. 2015. State Wildlife Action Plan. Available online at: http://www.gf.nd.gov/gnf/conservation/swap-2015/docs/swap-2015.pdf. Accessed December 2015.

Owen, S.F., M.A. Menzel, W.M. Ford, B.R. Chapman, K.V. Miller, J.W. Edwards, and P.B. Wood. 2003. Home-range size and habitat used by the Northern Myotis (*Myotis septentrionalis*). American Midland Naturalist, **150**(2):352-359.

Rogers, D.S., M.C. Belk, M.W. Gonzalez, and B.L. Coleman. 2006. Patterns of habitat use by bats along a riparian corridor in northeastern Utah. The Southwestern Naturalist 51:52–58.

Strickland, M.D., E.B. Arnett, W.P. Erickson, D.H. Johnson, G.D. Johnson, M.L. Morrison, J.A. Shaffer, and W. Warren-Hicks. 2011. Comprehensive guide to studying wind energy/wildlife interactions. Prepared for the National Wind Coordinating Collaborative. Washington, D.C.

Tetra Tech. 2015. Bat Habitat Assessment, Oliver III Wind Energy Center, Oliver and Morton Counties, North Dakota.

USFWS. 2012. Land-Based Wind Energy Guidelines. Available online at http://www.fws.gov/windenergy.

USFWS. 2015a. Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Northern Long-Eared Bat with 4(d) Rule. Federal Register 80(63): 17974-18033. Available online at http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/FRnlebFinalListing02April2015.pdf. Accessed October 2015.

USFWS. 2015b. Environmental Conservation Online System (ECOS). Endangered Mammals. Available online at:

http://ecos.fws.gov/tess_public/pub/SpeciesReport.do?groups=A&listingType=L&mapstatus=1. Accessed October 2015.

USFWS. 2015c. 2015 Range-Wide Indiana Bat Summer Survey Guidelines April 2015. Available online at: http://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/2015IndianaBatSummerSurveyGuidelines01April2015.pdf. Accessed April 2015.

USFWS 2015d. Indiana Bat Summer Survey Guidance. Automated Acoustic Bat ID Software Programs. Available online at: http://www.fws.gov/midwest/endangered/mammals/inba/surveys/inbaAcousticSoftware.html. Accessed October 2015.

USFWS. 2016. Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Northern Long-Eared Bat with 4(d) Rule. Federal Register 80(63): 17974-18033. Available online at: http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/FRnlebFinalListing02April2015.pdf. Accessed January 2016.

WAPA (Western Area Power Administration) and USFWS. 20154. Programmatic Biological Assessment for the Upper Great Plains Region Wind Energy Program, Final. April 2015.

Whitaker, J.O. 1995. Food of the big brown bat Eptesicus fuscus from maternity colonies in Indiana and Illinois. The American Midland Naturalist 134:346–360.

This page intentionally left blank

Appendix A – Site Photographs

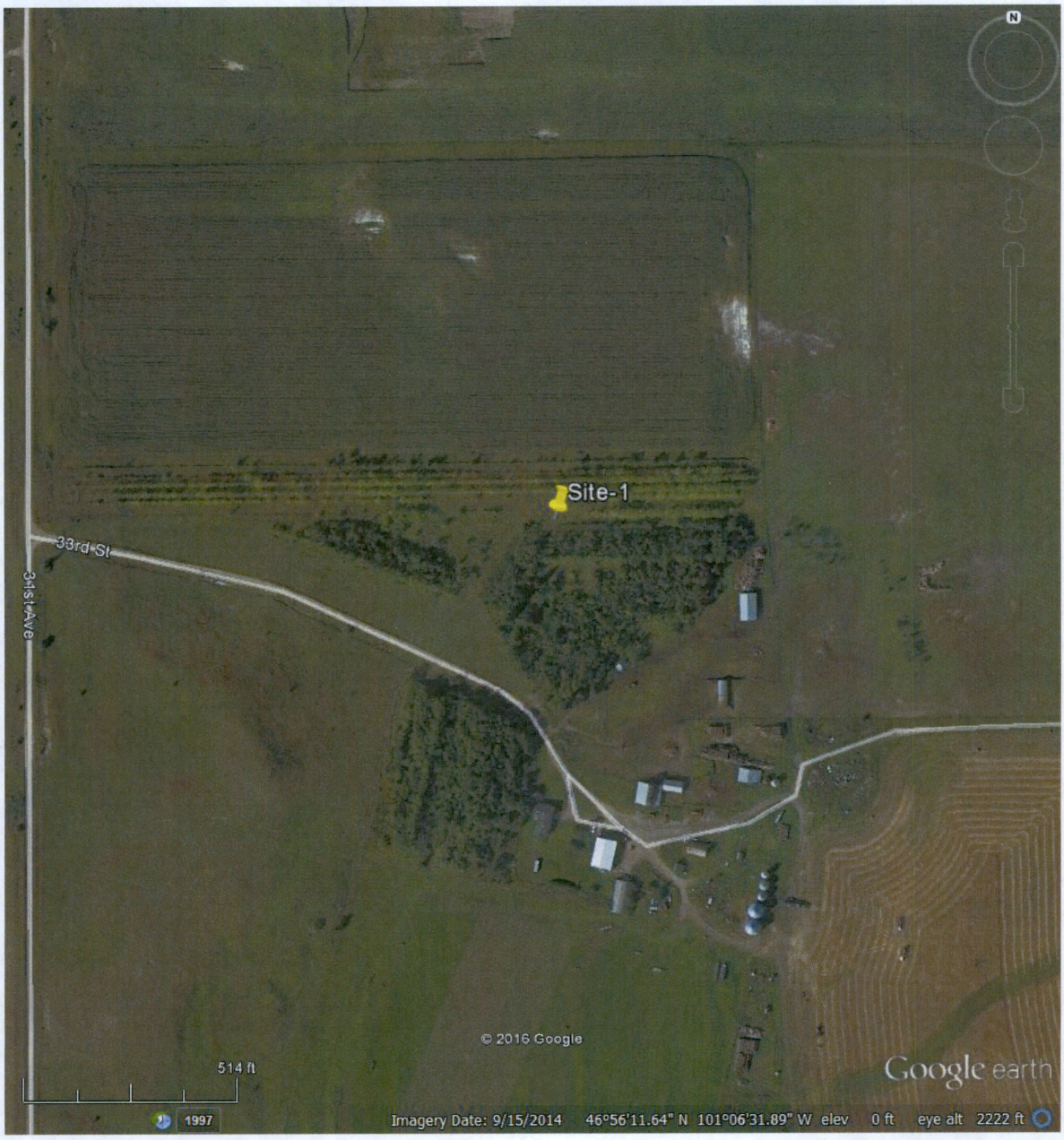
This page intentionally left blank

Location: Site-1

Several shelter belts and a woodlot surrounding a farm comprise over six acres of treed habitat at this sample location. The nearest open bodies of water are stock ponds between half and one mile to the northeast and east. Mature green ash and snags within the woodlot provide both suitable roosting and foraging habitats for bats. The detector was positioned between a woodlot and a shelterbelts, which created a foraging corridor for bats.

1) Detector setup and microphone oriented east along the woodlot. July 21, 2015.

2) Shelterbelt transitioning into woodlot adjacent to detector. July 21, 2015. View south.



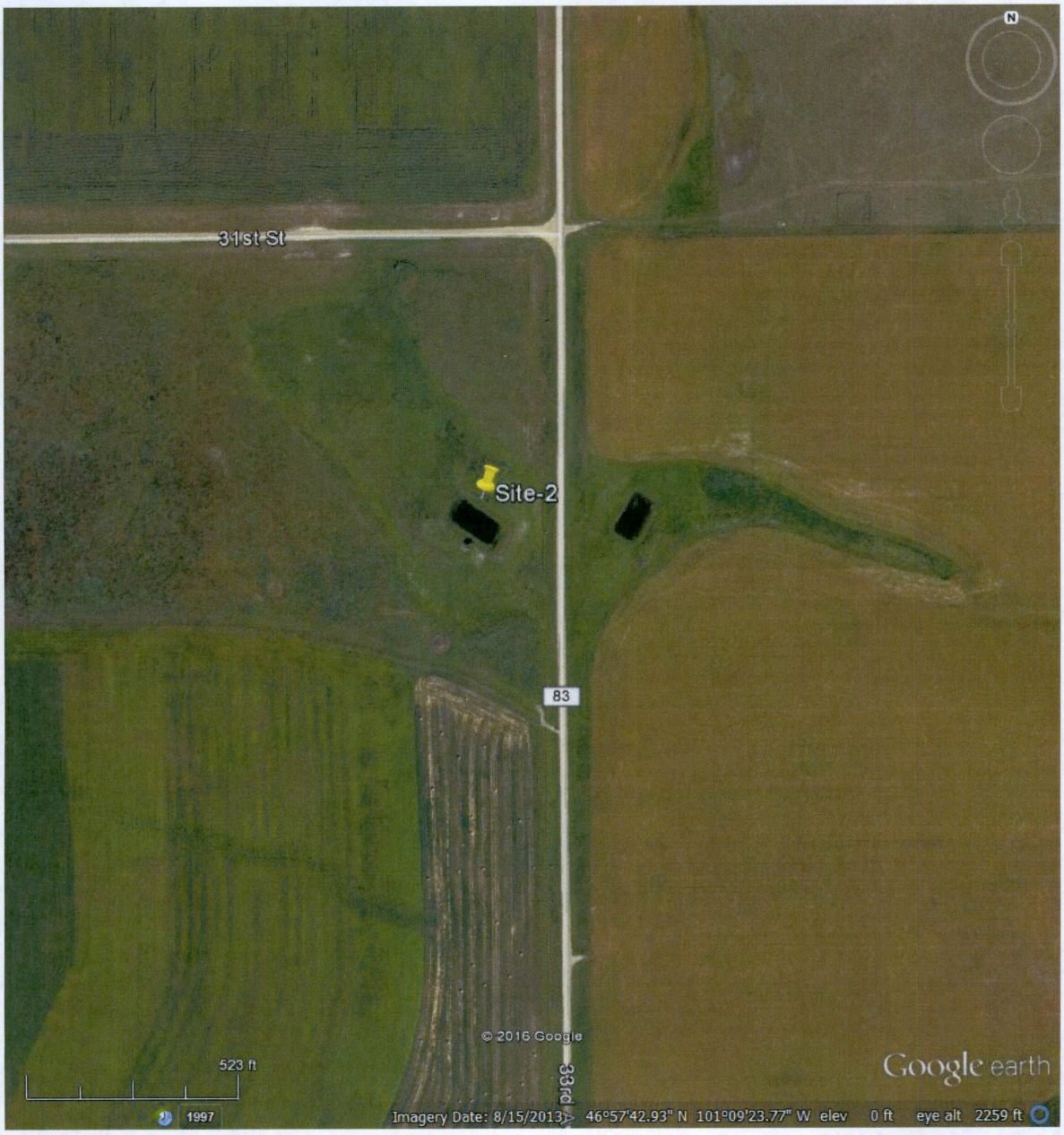
3) Overview of habitat surrounding Site 1.

Location: Site-2

Site 2 was established adjacent to a ¼ acre stock pond amid pasture and crop lands. Another stock pond was located 250 to the east across the road. The nearest woodlands or shelterbelts were associated with farmsteads located between ¾ to one mile to the north, west, and south.

4) The detector setup oriented south over a stock pond. July 21, 2015.

5) The detector is located in the far right of frame adjacent to the stock pond. The surrounding area is entirely pasture and crop land. July 21, 2015. View west.



6) Overview of habitat surrounding Site 2.

Location: Site-3

Site 3 was located adjacent to a mature shelter belt near a scrubby 4 acre patch surrounded by pastures and cropland.

7) Detector set up with microphone oriented along the shelterbelt edge. July 21, 2015. View to the north.

8) Shelterbelt adjacent to detector (detector is in the center of frame) and scrubby patch to the north (upper right in frame). July 21, 2015. View north

9) Overview of habitat surrounding Site 3.

Location: Site-4

Site 4 was located adjacent to a forested patch near an abandoned farmstead. The site is surrounded by cropland.

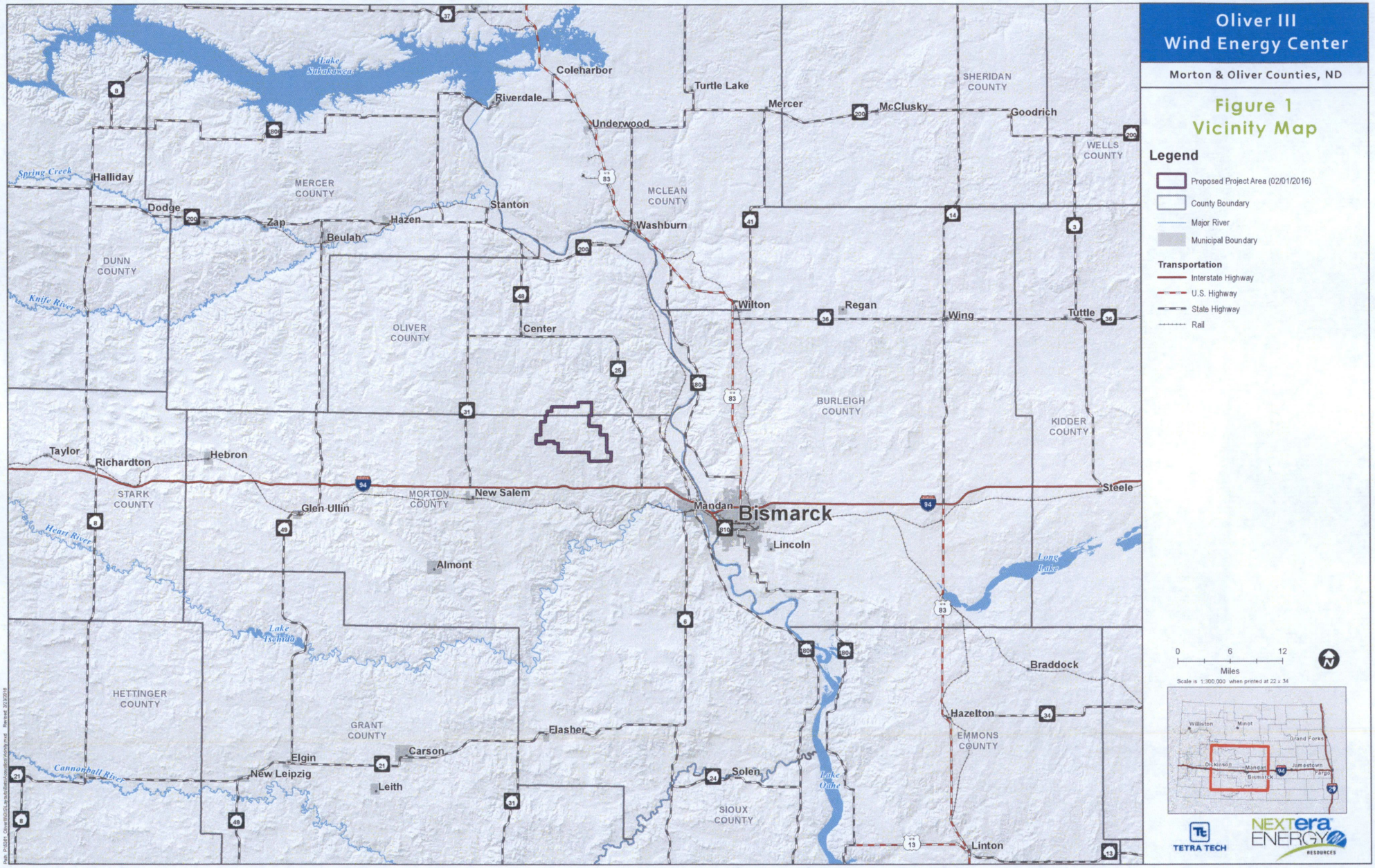
10) Detector was positioned on edge of the forested patch with the microphone oriented over an ephemeral pond. View north.

11) Abandoned farmstead to the south of detector location. View south.

9) Overview of habitat surrounding Site 4.

Appendix B – Figures

This page intentionally left blank



Oliver III Wind Energy Center

Morton & Oliver Counties, ND

Figure 1
Vicinity Map

Legend

- Proposed Project Area (02/01/2016)
- County Boundary
- Major River
- Municipal Boundary

Transportation

- Interstate Highway
- U.S. Highway
- State Highway
- Rail

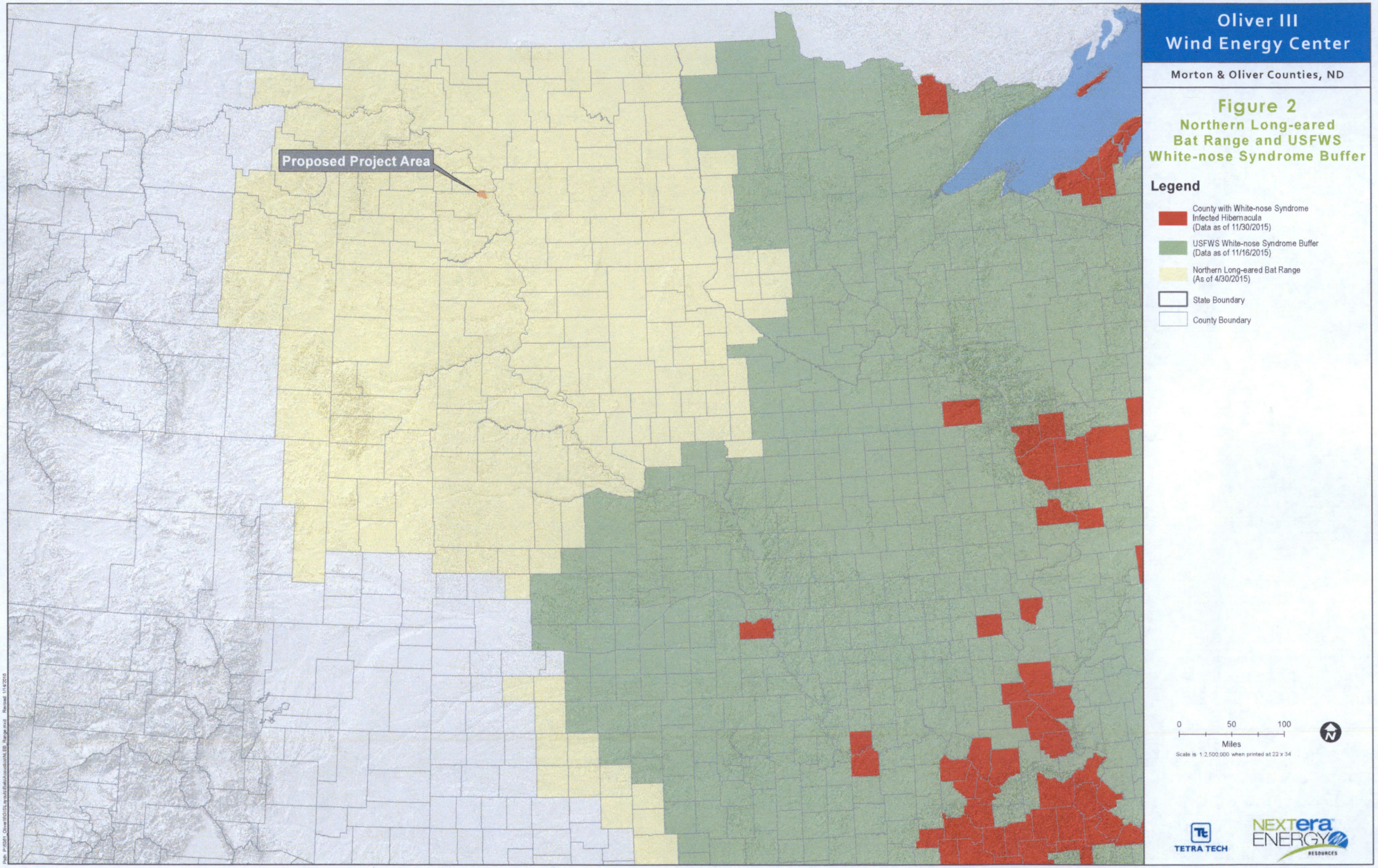
0 6 12

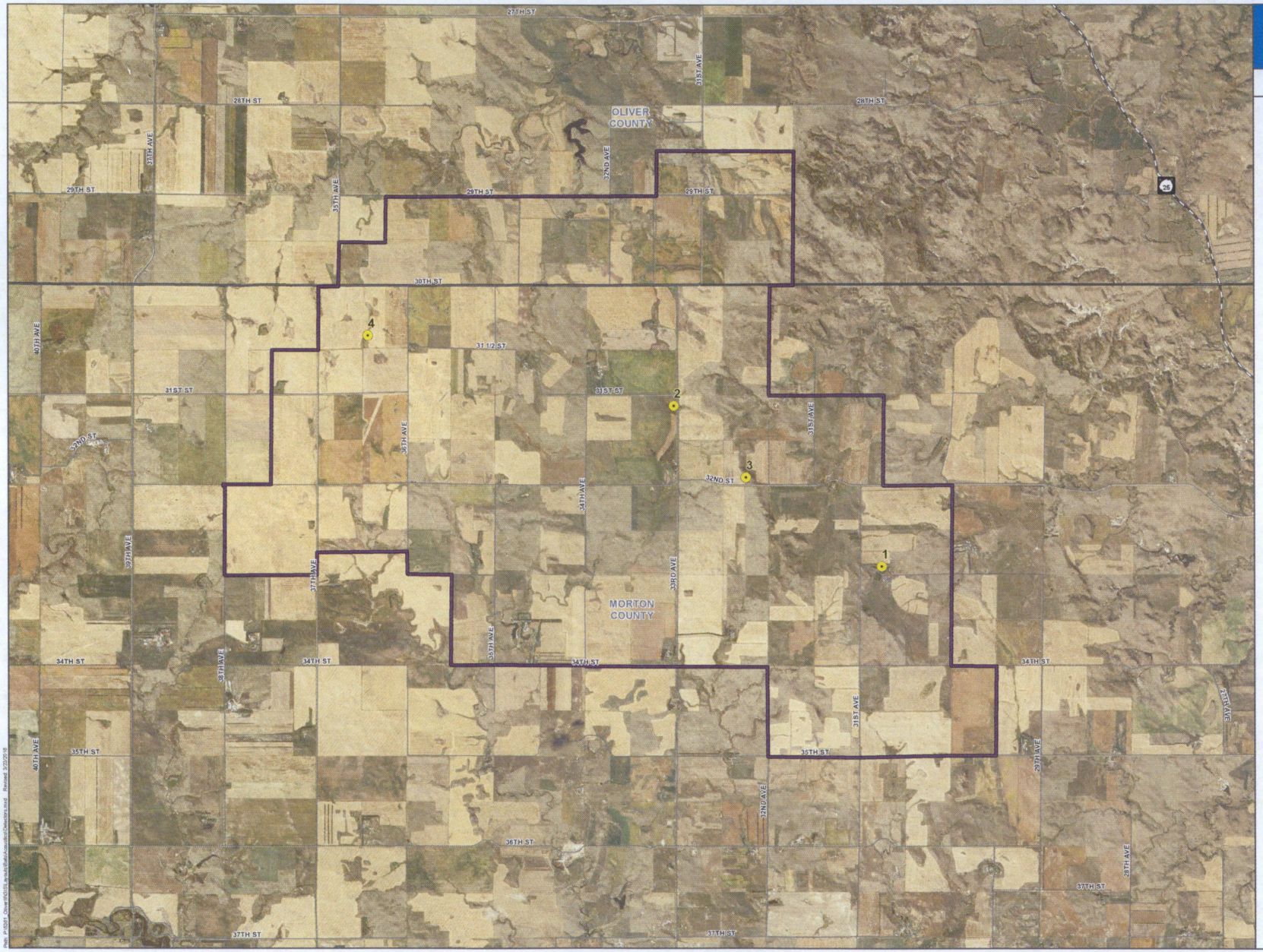
Miles

Scale is 1:300,000 when printed at 22 x 34

TETRA TECH

NEXTera ENERGY RESOURCES


Proposed Project Area
Oliver III
Wind Energy Center
Morton & Oliver Counties, ND
Figure 2
Northern Long-eared
Bat Range and USFWS
White-nose Syndrome Buffer
Legend
County with White-nose Syndrome
Infected Hibernacula
(Data as of 11/30/2015)
USFWS White-nose Syndrome Buffer
(Data as of 11/16/2015)
Northern Long-eared Bat Range
(As of 4/30/2015)
State Boundary
County Boundary
0
50
100
Miles
Scale is 1:2,500,000 when printed at 22 x 34
TETRA TECH
NEXTera
ENERGY
RESOURCES



Oliver III Wind Energy Center

Oliver and Morton Counties, ND

Figure 3
Bat Detector Locations

Legend

- Proposed Project Area (02/01/2016)
- County Boundary
- Major River
- Bat Detector Location

Transportation

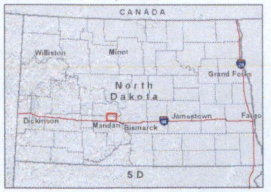
- State Highway
- County Road

*NAIP 2015 Aerial Imagery

0 0.5 1 1.5

Miles

Scale is 1:32,000 when printed at 22 x 34



TETRA TECH

NEXTera ENERGY RESOURCES