

**Emmons-Logan Wind Energy Center  
Application for Certificate of Site Compatibility  
Appendix B – Revised Reports**

**Final Northern Long-Eared Bat Habitat Assessment**

**Final Whooping Crane Habitat Review**

**2017 Grassland Assessment**

**2017 Sharp-tailed Grouse Lek Report**

**Emmons-Logan Wind, LLC**

**PU-18-280**

**Northern Long-Eared Bat Desktop Habitat Assessment  
Emmons-Logan Wind Energy Center and 230 kV Transmission Line  
Emmons and Logan Counties, North Dakota**

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**Final Report**

**Prepared for:**

Emmons-Logan Wind, LLC

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## **REPORT REFERENCE**

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## **INTRODUCTION**

Emmons-Logan Wind, LLC (Emmons-Logan Wind), a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC, is considering the development of the Emmons-Logan Wind Energy Center and 230 kV Transmission Line (Project) in east-central Emmons and southwest Logan counties, North Dakota. To evaluate potential northern long-eared bat (*Myotis septentrionalis*; NLEB) habitat and use within the proposed Project area and to address past recommendations from the U.S. Fish and Wildlife Service (USFWS) and North Dakota Game and Fish Department, Emmons-Logan Wind requested that Western Ecosystems Technology, Inc. (WEST) evaluate potential habitat for NLEB within the Project area during the summer months.

This report describes the results of the NLEB desktop habitat assessment completed for the Project by WEST, which was done following the Phase 1 survey recommendations found in the USFWS' *Northern Long-Eared Bat Interim Conference and Planning Guidance* (Guidance; USFWS 2014) and *2016 Range-Wide Indiana Bat Summer Survey Guidelines* (Guidelines; USFWS 2016).

### **Northern Long-eared Bat Summer Habitat Requirements**

The NLEB is a federally threatened species throughout its range listed under the Endangered Species Act (1973), but take due to operation of wind projects is exempt under a 4(d) rule (81 Federal Register 9: 1900-1922. 2016). The NLEB is a forest-dependent species that tends to avoid open habitats, generally relying on forest features for both foraging and roosting during the summer months (Owen et al. 2003, USFWS 2017), and requiring forest interior habitat with adequate canopy closure for both roost and foraging (Lausen 2009). Abundance of NLEB prey items, particularly beetles and moths, are typically higher in more closed forest stands than in forest openings, and wing morphology makes this bat species ideally suited for the high maneuverability required for gleaning-type foraging within a cluttered forest interior (Henderson and Broders 2008). Additionally, riparian areas are considered critical resource areas for many species of bats because they support higher concentrations of prey, provide drinking areas, and act as unobstructed commuting corridors (Grindal et al. 1999).

It is unlikely that NLEB would cross over large open areas (i.e., land lacking suitable habitat) to search for foraging and roosting habitats. Henderson and Broders (2008) found that NLEB did not travel more than 255 feet (ft; 68.6 meters [m]) from the edge of intact forest structure; however, they also have been documented to occur in agricultural settings where forest habitats have been highly fragmented. A study of nine female NLEB using an intensively managed forest in West Virginia found this species forages in areas with forest patch sizes between 114 – 161 acres (ac; 46.1 – 65.2 hectares [ha]; Owen et al. 2003), while studies in landscapes dominated by agricultural activities found NLEB used woodlots and riparian zones with as little as 15 – 50 ac (6.1 – 20.2 ha) of forest cover (Foster and Kurta 1999, Henderson and Broders 2008).

During the summer months, NLEB roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees (USFWS 2014). In general, NLEB seem opportunistic in selecting roosts, using tree species that retain bark or provide cavities or crevices. Rarely, NLEB have also been found roosting in structures like barns and sheds (USFWS 2015); however, any structures that may be used as roosts would be expected to be located relatively close to wooded habitat that would be used for foraging. Cooler roost locations such as caves and mines may be used by non-reproductive females and males (Bat Conservation International 2017); no caves or mines are present within the Project area or 2.5-mile (mi; 4-kilometer [km]) buffer.

## **PROJECT AREA**

The analysis was completed based on a Project boundary provided by Emmons-Logan Wind in 2017 encompassing about 75,056 acres (ac; 303.7 square kilometers [km<sup>2</sup>]; 117.3 square miles [mi<sup>2</sup>]) but is applicable to current Wind Energy Center boundary and the 230 kV Transmission Line as only minor adjustments have been made. The Project is located in the south-central North Dakota counties of Emmons and Logan, approximately 7 miles (mi; 11.3 kilometers [km]) northeast of the City of Linton (Figure 1). The landscape area is generally rolling to flat. Elevations range from 1,917.1 to 2,176.0 feet (ft; 584.3 to 663.2 meters [m]) above sea level. Historically, the landscape was grassland but has since been converted to agricultural use with crop production and livestock grazing the primary practices. Trees and shrubs can be found around farmsteads, within planted shelter belts, and along/within drainages. Natural wetlands are present and scattered throughout the Project and surrounding area. Common agricultural crops include small grains, corn, soybeans, sunflowers, and alfalfa.

## **HABITAT ASSESSMENT**

### **Methods**

The NLEB Guidance provides an estimate of the average maximum movement distance of 1.5 mi (2.4 km) for NLEB and 2.5 mi for Indiana bats. Using US Department of Agriculture's (USDA) 2016 National Agricultural Imagery Program imagery (USDA 2016) and National Land Cover Database (US Geological Survey 2011, Homer et al. 2015) data, WEST digitized trees, considered potential NLEB summer habitat, within the Project area and within a 2.5 mi buffer around the Project. The larger 2.5 mi buffer was used to provide a conservative estimate of the potential foraging range of NLEB and to depict any potential corridors of connected habitat in the vicinity of the Project.

A habitat analysis was then conducted to assess connectivity of suitable foraging (i.e., woodlots, forested riparian corridors, and areas adjacent to these habitats), roosting, or commuting (i.e., shelterbelts/tree-lines, wooded hedgerows) habitats. Given that NLEB have similar habitat requirements as Indiana bats, the approach used in this habitat evaluation followed recommendations for habitat assessment included in the USFWS' *Indiana Bat Section 7 and Section 10 Guidance for Wind Energy Projects* (USFWS 2011). This guidance assesses the

potential for bats to use the Project area based on presence of travel/commuting corridors within the Project boundary and connectivity to foraging or roosting habitat within a 2.5 mi buffer of the Project. Connectivity is defined in the guidance as commuting habitat within 1,000 ft (304.8 m) and connected to roosting or foraging habitat within 2.5 mi of the Project boundary (USFWS 2011). The 1,000 ft distance is based on studies of Indiana and NLEB behavior using telemetry data on foraging activity, which indicated that isolated trees or small patches might only be suitable as habitat when they are less than 1,000 ft from other forested/wooded habitats; therefore, it is reasonable to conclude that these bats are unlikely to occur within areas located more than 1,000 ft from roosting/foraging habitat (USFWS 2011, 2014).

For purposes of this review, WEST categorized habitat patches equal to, or smaller than 14 ac (5.6 ha), as potential commuting/travel corridors (generally shelterbelts or small woodlots); patches 15 – 50 ac (6.1 – 20.2 ha) were considered small roosting/foraging areas (larger woodlots or riparian forests); and patches greater than 50 ac (20.2 ha) were considered medium-large roosting/foraging areas (larger contiguous forests or riparian corridors).

## **Results**

Wooded habitat within the Project area is generally confined to small (less than 14 ac [6.1 ha]), scattered woodlots and tree rows that would not be considered suitable summer habitat for NLEB (Figure 1). There are three small (15 to 50 ac [6.1 – 20.2 ha]) wooded fragments in the northern half of the Project area that could provide potential roosting habitat for NLEB. One wooded area is partially within the 230 kV Transmission Line corridor. These wooded areas were analyzed to determine potential foraging and/or travel corridors around them by looking at the area within a 1,000-foot buffer. There were no direct wooded travel corridors between these three small patches and each other or other larger patches of wooded areas. The 2.5 mi buffer did not contain any treed areas greater than or equal to 15 ac (Figure 1).

Imagery analysis shows all potential roost/reproduction sites to consist of planted tree rows with a variety of tree sizes and species; both the potential roost sites and corresponding foraging areas are associated with, or encompass, active farmsteads.

Based on the remoteness of the Project from native tree areas (all three areas within the 15-50 ac [6.1-20.2 ha] were planted trees as well as most other smaller treed areas being tree rows or shelter belts), lack of connection to larger riparian areas (e.g., Missouri River), and lack of hibernaculum near the Project, it is unlikely that the NLEB has summer presence in the Project.

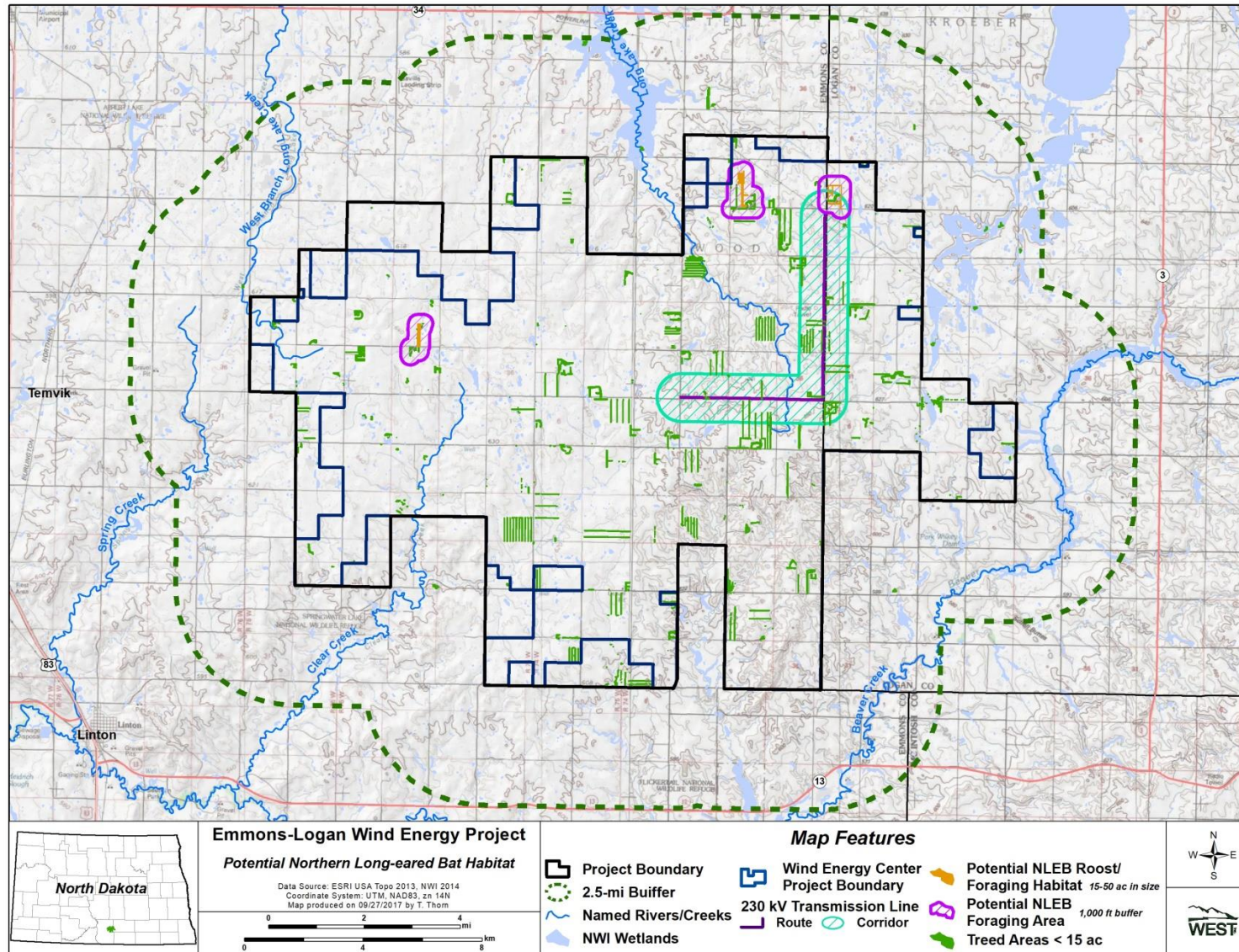


Figure 1. Potential northern long-eared bat habitat within the proposed Emmons-Logan Wind Project in Emmons and Logan Counties, North Dakota, and associated 2.5-mile buffer.

## REFERENCES

- 81 Federal Register (FR) 9: 1900-1922. 2016. Endangered and Threatened Wildlife and Plants; 4(D) Rule for the Northern Long-Eared Bat; Final Rule. 50 CFR 17. Department of the Interior, Fish and Wildlife Service. 81 FR 1900. January 14, 2016. Available online: <http://www.fws.gov/Midwest/endangered/mammals/nleb/pdf/FRnlebFinal4dRule14Jan2016.pdf>
- Bat Conservation International. 2017. Species Profile: *Myotis Septentrionalis*. Available online at: <http://www.batcon.org/index.php/resources/media-education/species-profiles/detail/2306>. Accessed on June 6, 2017.
- Endangered Species Act (ESA). 1973. 16 United States Code (USC) §§ 1531-1544, Public Law (PL) 93-205, December 28, 1973, as amended, PL 100-478 [16 USC 1531 *et seq.*]; 50 Code of Federal Regulations (CFR) 402.
- Foster, R. W. and A. Kurta. 1999. Roosting Ecology of the Northern Bat (*Myotis Septentrionalis*) and Comparisons with the Endangered Indiana Bat (*Myotis Sodalis*). *Journal of Mammalogy* 80: 659-672.
- Grindal, S. D., J. L. Morissette, and R. M. Brigham. 1999. Concentration of Bat Activity in Riparian Habitats over an Elevational Gradient. *Canadian Journal of Zoology* 77(6): 972-977. doi: 10.1139/z99-062.
- Henderson, L. E. and H. G. Broders. 2008. Movements and Resource Selection of the Northern Long-Eared Myotis (*Myotis Septentrionalis*) in a Forest-Agriculture Landscape. *Journal of Mammalogy* 89: 952-963.
- Lausen, C. 2009. Status of the Northern Myotis (*Myotis Septentrionalis*) in Alberta. Alberta Wildlife Status Report No. 3: (Update 2009).
- 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.
- North American Datum (NAD). 1983. Nad83 Geodetic Datum.
- USA Topo. 2013. USA Topo Maps. US Geological Survey (USGS) topographical maps for the United States. ArcGIS. ESRI, producers of ArcGIS software. Redlands, California.
- US Department of Agriculture (USDA). 2016. Imagery Programs - National Agriculture Imagery Program (Naip). USDA - Farm Service Agency (FSA). Aerial Photography Field Office (APFO), Salt Lake City, Utah. Accessed December 2016. Information available online: <http://www.fsa.usda.gov/programs-and-services/aerial-photography/imagery-programs/index>
- US Fish and Wildlife Service (USFWS). 2011. Indiana Bat Section 7 and Section 10 Guidance for Wind Energy Projects. Revised October 26, 2011. Available online: <http://www.fws.gov/midwest/endangered/mammals/inba/pdf/inbaS7and10WindGuidanceFinal26Oct2011.pdf>
- US Fish and Wildlife Service (USFWS). 2014. Northern Long-Eared Bat Interim Conference and Planning Guidance. USFWS Regions 2, 3, 4, 5, and 6. January 6, 2014. Available online: <http://www.fws.gov/northeast/virginiafield/pdf/NLEBinterimGuidance6Jan2014.pdf>

- US Fish and Wildlife Service (USFWS). 2015. Northern Long-Eared Bat (*Myotis Septentrionalis*). USFWS Fact Sheet. Endangered Species, USFWS. April 2015. Available online at: <https://www.fws.gov/midwest/endangered/mammals/nleb/pdf/NLEBFactSheet01April2015.pdf>
- US Fish and Wildlife Service (USFWS). 2016. 2016 Rangewide Indiana Bat Summer Survey Guidelines. Updated April 11, 2016. Available online: <http://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/2016IndianaBatSummerSurveyGuidelines11April2016.pdf>
- US Fish and Wildlife Service (USFWS). 2017. Northern Long-Eared Bat (*Myotis Septentrionalis*). USFWS Environmental Conservation Online System (ECOS) Species Profile. Updated October 2016. ECOS available at: <http://ecos.fws.gov/ecos/indexPublic.do>; Northern long-eared bat species profile available online at: <https://ecos.fws.gov/ecp0/profile/speciesProfile?sld=9045>
- US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI). 2014. Seamless Wetlands Data by State: North Dakota. USFWS NWI Data Mapper. USFWS NWI, Fort Snelling, Minnesota. Updated May 1, 2014. Geodatabase and Shapefile data available online at: <http://www.fws.gov/wetlands/data/State-Downloads.html>
- US Geological Survey (USGS). 2011. National Land Cover Database 2011 (NLCD 2011). Multi-Resolution Land Characteristics Consortium (MRLC), National Land Cover Database (NLCD). USGS Earth Resources Observation and Science (EROS) Center, Sioux Falls, South Dakota. Information available online: <http://www.mrlc.gov/nlcd2011.php>; Legend information online: [http://www.mrlc.gov/nlcd11\\_leg.php](http://www.mrlc.gov/nlcd11_leg.php)