

**2017 Raptor Nest Survey  
Aurora Wind Energy Project  
Williams County, North Dakota**

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**Prepared for:**

**Aurora Wind Project, LLC**

16105 West 113th Street, Suite 105

Lenexa, Kansas 66219

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**Prepared by:**

**Clayton Derby, Katherine Moratz, and Terri Thorn**

Western EcoSystems Technology, Inc.

4007 State Street, Suite 109

Bismarck, North Dakota 58503

**January 17, 2018**



**STUDY PARTICIPANTS**  
**Western EcoSystems Technology**

Clayton Derby

Terri Thorn

Katherine Moratz

Sofia Agudelo

Derek Klostermeier

Project Manager

GIS Technician

Report Writer

Technical Editor

Research Biologist

**REPORT REFERENCE**

Derby, C., K. Moratz, and T. Thorn. 2018. Raptor Nest Survey Aurora Wind Energy Project, Williams County, North Dakota. Final Draft: January 17, 2018. Prepared for Tradewind Energy, Lenexa, Kansas. Prepared by Western EcoSystems Technology, Inc. (WEST). Bismarck, North Dakota.

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## **1.0 INTRODUCTION**

Aurora Wind Project, LLC (Aurora) is considering development of the Aurora Wind Energy Project (Project) in Williams County, North Dakota (Figure 1). Aurora contracted Western EcoSystems Technology, Inc. (WEST) to conduct an aerial raptor nest survey in the Project area and surrounding 1-mile (mi; 1.6 kilometers [km]) and 10-mi (16.1-km) buffers, with emphasis on bald eagle (*Haliaeetus leucocephalus*) nests. The aerial survey was conducted following the guidance provided in the U.S. Fish and Wildlife Service (USFWS) *Eagle Conservation Plan Guidance: Module 1 – Land-based Wind Energy, Version 2* (ECPG; USFWS 2013), and the USFWS Interim Golden Eagle Inventory and Monitoring Protocols (Pagel et al. 2010).

## **2.0 STUDY AREA**

The Project, located approximately four mi (6.4 km) northwest of the Town on Tioga, in Williams County, northwestern North Dakota, falls mostly within the Missouri Coteau Slope Level IV Ecoregion and partially within the Glaciated Dark Brown Prairie Level IV Ecoregion, in the Northwestern Glaciated Plains Level III Ecoregion (USEPA 2016). The Missouri Coteau Slope Level IV Ecoregion slopes westward toward the Missouri River and contains a number of small wetlands; farming most often occurs on the level to rolling topography while cattle graze on steeper areas along drainages. The Glaciated Dark Brown Prairie Level IV Ecoregion, a mosaic of croplands and rangelands, is a transition to drier conditions and contains fewer wetlands than the Missouri Coteau Slope. Topography is flat to rolling and is characterized by moraines created during the glacial period.

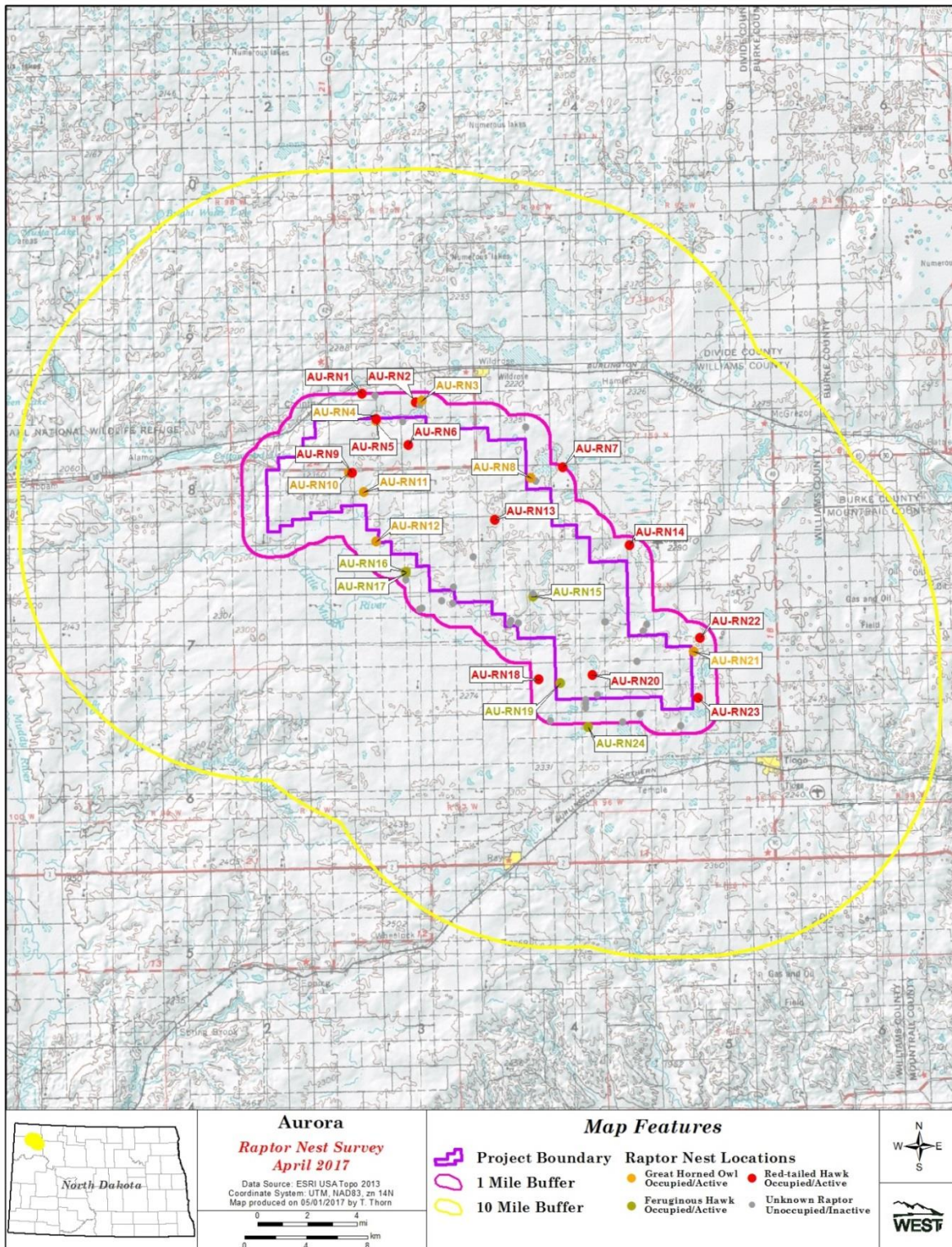


Figure 1. Overview of the proposed Aurora Wind Energy Project and associated buffers, in Williams County, North Dakota, and location of raptor nests\* recorded in the study area during aerial surveys conducted on April 20 – 21, 2017.

\* Nest IDs for unoccupied/inactive raptor species (grey circles) are not shown.

### **3.0 METHODS**

An aerial survey was conducted from a Robinson R44 helicopter by a qualified biologist and experienced pilot on April 20 – 21, 2017. The goal of the survey was to document raptor nests within the Project area and associated buffers, with emphasis on eagle nests. The survey was timed to coincide with the period prior to leaf out conditions when bald eagles were likely incubating eggs or tending young in the region (USFWS 2007), and when other raptor species were likely to be nesting as well. Raptors are defined here as kites, accipiters, buteos, harriers, eagles, falcons, and owls; however, the main focus of the survey was to identify bald eagle nests.

Pre-flight planning included the creation of field maps and mobile Geographic Information System files and review of relevant background information, such as previously recorded nest locations, topographic maps, and aerial photographs. A survey route was planned using aerial imagery and the U.S. Geological Survey (USGS) National Land Cover Database (NLCD; Homer et al. 2015, USGS 2013) to cover all suitable bald eagle and raptor nesting habitat within 10-mi (16.1-km) of the Project. Suitable nesting habitat included wooded areas, riparian corridors, and forested margins of waterbodies. The locations of all potential and confirmed raptor nests, regardless of their activity status, were recorded using a hand-held Global Positioning System (GPS) unit; coordinates were set at Universal Transverse Mercator (UTMs) North American Datum (NAD) 83 unit.

All raptor nests found within the Project area and 1-mi (1.6-km) buffer were recorded; all eagle nests found within the Project area and associated 1- and 10-mi (16.1-km) buffers were recorded. Within the Project area and 1-mi (1.6-km) buffer, transects were flown approximately 0.5-mi (0.8-km) apart to provide complete coverage of all areas where construction impacts may occur. Within the 10-mi (16-km) buffer, transects were flown approximately 1-mi (1.6-km) apart. The survey track was recorded using a handheld GPS unit to ensure that all areas were adequately covered. The helicopter was positioned to allow a full visual inspection of the habitat and to provide a view of the tops of the tallest dominant trees where bald eagles generally prefer to nest (Buehler 2000). During the survey, the helicopter was flown approximately 150 to 200 feet (ft; 46 to 61 meters [m]) above ground level at approximately 75 mi (121 km) per hour.

Data recorded for each observed nest site included:

*Nest Identification (ID)* - WEST assigned a unique nest identification number for each occupied/active nest documented.

*Species* - A species was assigned to each nest when possible; otherwise, it was classified as an unknown raptor species nest. Unknown raptor species nests are defined here as any stick nest that did not have an occupant associated with it at the time of the survey. Unknown raptor species nests, including old nests or nests that could become suitable for raptors, were

documented in order to create a nest database for use during future surveys to identify all potentially suitable nest sites.

*Nest Status* - WEST categorizes basic nest use consistent with definitions from the USFWS ECPG (USFWS 2013). Nests were classified as “occupied” if any of the following were observed at the nest structure: (1) an adult in an incubating position; (2) eggs; (3) nestlings or fledglings; (4) occurrence of a pair of adults or sub-adults; (5) a newly constructed or refurbished stick nest in the area where territorial behavior of a raptor had been observed early in the breeding season; or (6) a recently repaired nest with fresh sticks (clean breaks) or fresh boughs on top, and/or droppings, and/or molted feathers on its rim or underneath. Occupied nests were further classified as “active” if an adult in an incubating or brooding position, an egg or eggs, and/or nestlings/fledglings were observed, or “inactive” if no eggs or chicks were present. Nests that did not meet the above criteria for “occupied” were classified as “unoccupied”.

*Nest Condition* - Nest condition was categorized using descriptions ranging from poor to excellent. While this designation varies between observers, it gives a general sense of when a nest or nest site may have last been used. Nests in fair to poor condition are characterized by varying degrees of disrepair, sloughing, or sagging heavily, and would require some level of effort to rebuild in order to be suitable for successful nesting. Nests in good to excellent condition are those that appear to have been well maintained, have a well-defined bowl shape, are not sagging or sloughing, and appear to be suitable for nesting.

*Nest Substrate* - The substrate in which a nest was observed was recorded to provide observers a visual reference. Substrates range from manmade structures (such as power lines, nest platforms, and dock hoists) to biological and physical structures (conifer and deciduous tree species, cliff faces, and rock outcrops).

## **4.0 RESULTS**

No bald eagle nests were observed within the Project area or associated buffers. Twenty-four occupied/active raptor nests representing three raptor species were identified during aerial surveys conducted in 2017, 10 within the Project area and 14 within the 1-mi buffer (Figure 1; Table 1). These nests were classified as follows: 12 occupied/active red-tailed hawk (*Buteo jamaicensis*) nests, seven occupied/active great horned owl (*Bubo virginianus*) nests, and five occupied/active ferruginous hawk (*Buteo regalis*) nests.

Twenty-nine unoccupied/inactive unknown raptor nests were documented during the aerial raptor nest survey (Figure 1; Table 1). Eleven of the unoccupied/inactive unknown raptor species nests were located within the Project area, of which only three were considered to be in good condition and could be used as future nest sites. None of the nests were consistent with the size and structure of bald eagle nests.

No federally listed raptor species were observed nesting within the Project area or associated buffers during surveys conducted in 2017; however, the ferruginous hawk, a Level I Species of Conservation Priority in North Dakota (Dyke et al. 2015), was recorded nesting within the Project area and 1-mi (1.6-km) buffer (Figure 1; Table 1). Level I species have a high conservation priority due to declining populations across North Dakota and/or their range (Dyke et al. 2015).

**Table 1. Summary of raptor nests identified during the aerial raptor nest survey conducted on April 20 – 21, 2017 for the proposed Aurora Wind Energy Project, Williams County, North Dakota.**

<b>Nest ID</b>	<b>Species<sup>1</sup></b>	<b>Nest Status</b>	<b>Nest Condition</b>	<b>Nest Substrate</b>	<b>Within Project Boundary?</b>	<b>Comments</b>
AU-RN1	RTHA	occupied/active	good	tree	no	Incubating
AU-RN2	RTHA	occupied/active	good	tree	no	Incubating
AU-RN3	GHOW	occupied/active	good	tree	no	Incubating
AU-RN4	GHOW	occupied/active	good	tree	yes	Incubating
AU-RN5	RTHA	occupied/active	good	tree	yes	Incubating
AU-RN6	RTHA	occupied/active	good	tree	yes	Incubating
AU-RN7	RTHA	occupied/active	good	tree	no	Incubating
AU-RN8	GHOW	occupied/active	good	tree	no	Incubating
AU-RN9	RTHA	occupied/active	good	tree	yes	
AU-RN10	GHOW	occupied/active	good	tree	yes	Incubating
AU-RN11	GHOW	occupied/active	good	tree	yes	Incubating
AU-RN12	GHOW	occupied/active	good	tree	no	Incubating
AU-RN13	RTHA	occupied/active	good	tree	yes	Incubating
AU-RN14	RTHA	occupied/active	good	tree	no	Incubating
AU-RN15	FEHA	occupied/active	good	tree	yes	Incubating
AU-RN16	FEHA	occupied/active	good	tree	no	Incubating
AU-RN17	FEHA	occupied/active	good	tree	no	Incubating
AU-RN18	RTHA	occupied/active	good	tree	no	
AU-RN19	FEHA	occupied/active	good	tree	yes	Incubating
AU-RN20	RTHA	occupied/active	good	tree	yes	Incubating
AU-RN21	GHOW	occupied/active	good	tree	no	Incubating
AU-RN22	RTHA	occupied/active	good	tree	no	
AU-RN23	RTHA	occupied/active	good	tree	no	
AU-RN24	FEHA	occupied/active	good	tree	no	Incubating
AU-UNK1	UNKN	unoccupied/inactive	disrepair	tree	no	
AU-UNK2	UNKN	unoccupied/inactive	disrepair	tree	Yes	
AU-UNK3	UNKN	unoccupied/inactive	good	tree	no	
AU-UNK4	UNKN	unoccupied/inactive	disrepair	tree	no	
AU-UNK5	UNKN	unoccupied/inactive	good	tree	no	
AU-UNK6	UNKN	unoccupied/inactive	disrepair	tree	yes	
AU-UNK7	UNKN	unoccupied/inactive	disrepair	tree	no	
AU-UNK8	UNKN	unoccupied/inactive	good	tree	no	
AU-UNK9	UNKN	unoccupied/inactive	disrepair	tree	no	
AU-UNK10	UNKN	unoccupied/inactive	disrepair	tree	no	
AU-UNK11	UNKN	unoccupied/inactive	disrepair	tree	no	
AU-UNK12	UNKN	unoccupied/inactive	disrepair	tree	yes	
AU-UNK13	UNKN	unoccupied/inactive	disrepair	tree	yes	
AU-UNK14	UNKN	unoccupied/inactive	disrepair	tree	yes	
AU-UNK15	UNKN	unoccupied/inactive	good	tree	yes	
AU-UNK16	UNKN	unoccupied/inactive	good	tree	yes	
AU-UNK17	UNKN	unoccupied/inactive	good	tree	yes	

**Table 1. Summary of raptor nests identified during the aerial raptor nest survey conducted on April 20 – 21, 2017 for the proposed Aurora Wind Energy Project, Williams County, North Dakota.**

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AU-UNK18	UNKN	unoccupied/inactive	disrepair	Tree	yes	
AU-UNK19	UNKN	unoccupied/inactive	good	tree	no	
AU-UNK20	UNKN	unoccupied/inactive	disrepair	tree	no	
AU-UNK21	UNKN	unoccupied/inactive	disrepair	tree	yes	
AU-UNK22	UNKN	unoccupied/inactive	disrepair	tree	yes	
AU-UNK23	UNKN	unoccupied/inactive	disrepair	tree	no	
AU-UNK24	UNKN	unoccupied/inactive	disrepair	tree	no	
AU-UNK25	UNKN	unoccupied/inactive	disrepair	tree	no	
AU-UNK26	UNKN	unoccupied/inactive	disrepair	tree	no	
AU-UNK27	UNKN	unoccupied/inactive	good	tree	no	
AU-UNK28	UNKN	unoccupied/inactive	disrepair	tree	no	
AU-UNK29	UNKN	unoccupied/inactive	good	tree	no	

<sup>1</sup> RTHA = red-tailed hawk; GHOW = great horned owl; FEHA = ferruginous hawk; UNKN = Unknown raptor species

## **5.0 DISCUSSION**

The aerial raptor nest survey provided information on raptor and eagle nesting activity within and near the Project area. Red-tailed hawks and great horned owls, common and wide spread nesting species throughout North Dakota, were the most common species with occupied/active nests. No bald eagle nests were observed during the 2017 aerial survey. The Project is located in an area dominated by crop lands and hayfields/pastures with relatively little forest cover and no large lakes that would provide suitable foraging and nesting habitat for bald eagles. Although no eagle nests were found during the aerial survey, eagle use within the Project area could be influenced by suitable nesting and foraging habitat for eagles associated with large waterbodies to the north and east of the Project area (Tom Berg Lake, Helle Slough, Cottonwood Lake, and Alkali Lake).

The ferruginous hawk, a Level I State Species of Conservation Priority (Dyke et al. 2015), was observed nesting within the Project area and associated buffers. Research in North Dakota suggested that ferruginous hawks, a grassland-adapted species, were negatively affected by increases in fragmentation, cropland, and woodland, and decreases in colonial mammal prey (McCarthy 2006).

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