

**EXHIBIT 13**  
**Sharp-tailed Grouse Lek and Raptor Stick**  
**Nest Survey Report**

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**Wildlife Baseline Studies for the  
New Frontier Wind Resource Area  
McHenry County, North Dakota**

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**Sharp-tailed Grouse Lek and Raptor Stick Nest Report  
Spring 2011**

**Prepared for:**

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NATURAL RESOURCES ♦ SCIENTIFIC SOLUTIONS

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## **EXECUTIVE SUMMARY**

Western EcoSystems Technology, Inc. conducted aerial sharp-tailed grouse lek and aerial and ground-based raptor stick nest surveys in April and May 2011 at the New Frontier Wind Resource Area (NFWRA), located in McHenry County, North Dakota. This report presents results of those surveys.

Aerial sharp-tailed grouse lek surveys were conducted on April 11, April 26, and May 12, 2011 at the NFWRA. A total of 77 individual sharp-tailed grouse were observed along approximately 185.5 kilometers (115.3 miles) of transects. Two probable leks were documented within 0.8 kilometers (0.5 miles) of the NFWRA western boundary while one probable and one possible lek were recorded within the NFWRA. Other observations of individual birds were also recorded but do not constitute a lek.

A total of 18 potential raptor stick nests were documented during both aerial and ground-based surveys in or within 3.2 kilometers (2 miles) of the NFWRA. None of these nests had the structure consistent with that of an eagle nest. Eleven of the 18 nests were located within the NFWRA boundary and three of those were confirmed active with a fourth possibly active. The possible active nest had a red-tailed hawk perched next to it while species determination could not be made at the others due to distance of the nest from the observer or the location the raptor within the nest.

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## **INTRODUCTION**

The New Frontier Wind Resource Area (NFWRA) is proposed for development in McHenry County, North Dakota. Meadowlark Wind I LLC (Element Power US, LLC) contracted Western EcoSystems Technology, Inc. (WEST) to develop and implement a survey effort for sharp-tailed grouse (*Tympanuchus phasianellus*) leks and raptor nests. This report presents results of aerial sharp-tailed grouse lek surveys, aerial large stick nest surveys, and ground base stick nest surveys during April and May 2011.

## **STUDY AREA**

The NFWRA, currently about 11,082 acres (ac; 48.8 square kilometers [km<sup>2</sup>]; 17.3 square miles [mi<sup>2</sup>]) is located in north-central North Dakota and more specifically southwest McHenry County. The landscape within the NFWRA is gently rolling with numerous wetlands scattered throughout. Most historical grasslands have 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 drainages (see Derby and Thorn 2011 for complete description of the study area).

## **METHODS**

### **Aerial Sharp-tailed Grouse Lek Surveys**

The objective of the aerial sharp-tailed grouse lek survey was to determine the approximate location of sharp-tailed grouse leks and provide a general sense of sharp-tailed grouse use within and immediately adjacent to the NFWRA during peak lekking activity (early April through mid-May). Survey methodology was similar to that used for greater prairie chickens (*Tympanuchus cupido*) in Oklahoma (Martin and Knopf 1981).

#### *Survey Methods*

North/south running transects started 800 meters (m; 0.5 miles[mi]) outside the east/west NFWRA boundary and were placed at approximate 400 m (0.25 mi) intervals, covering the entire NFWRA (Figure 1). The length of each transect varied based on the project boundary but each transect extended 800 m (0.5 mi) beyond the boundary. Each transect was flown with fixed-winged aircraft at an approximate height of 30 to 46 m (100 – 150 feet (ft)) above ground level during three separate survey periods. Surveys were conducted approximately two weeks apart and occurred during normal sharp-tailed grouse lekking activity on the northern plains. Surveys began between 15 minutes before sunrise and sunrise depending on cloud cover and lasted for up to two hours. The location of any sharp-tailed grouse observed was recorded with a global positioning system (GPS) unit. The number, activity, and lek status at each location was recorded.

## **Raptor Nest Surveys**

The objective of the raptor nest surveys was to locate and record potential raptor nests that may be subject to disturbance and/or displacement effects by wind-energy facility construction and/or operation. Surveys were focused on large, stick nest structures, and did not include searches for cavity nests or nests on the ground.

### *Survey Methods*

Two survey methods were used to document potential raptor nests within and adjacent to the NFWRA. A 3.2 kilometer (km; 2 mi) buffer surrounding the project boundary was surveyed by fixed-winged aircraft to document large nest structures indicative of eagle nests (Figure 2). This buffer area was flown at an approximate height of 61 m (200 ft) along approximately 800 m (0.5 mi) spaced intervals. A GPS unit was used to record potential raptor stick nest locations.

A second type of raptor nest survey was ground based and completed by driving and walking along public roads and accessible private roads within the NFWRA and a 1.6 km (1 mi) buffer surrounding the NFWRA boundary during leaf-off conditions and looking for raptor nest structures within areas of suitable habitat (trees, power line poles, etc). Potential raptor nests were recorded on aerial photo maps and digitized with geographic information system (GIS) software. Other information recorded included nest status, nest height, and nest material.

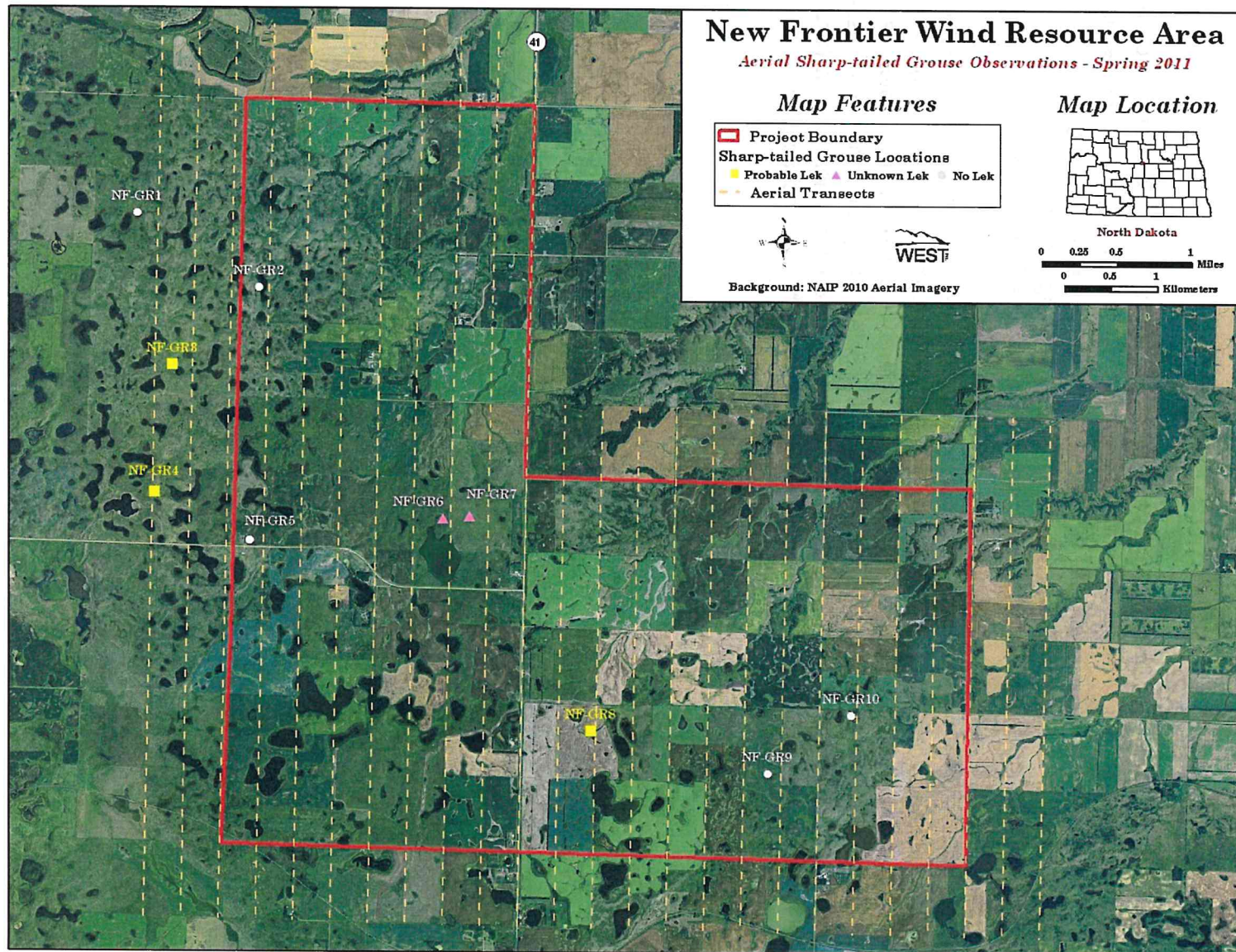


Figure 1. Sharp-tailed grouse observations at the New Frontier Wind Resource Area during spring 2011.

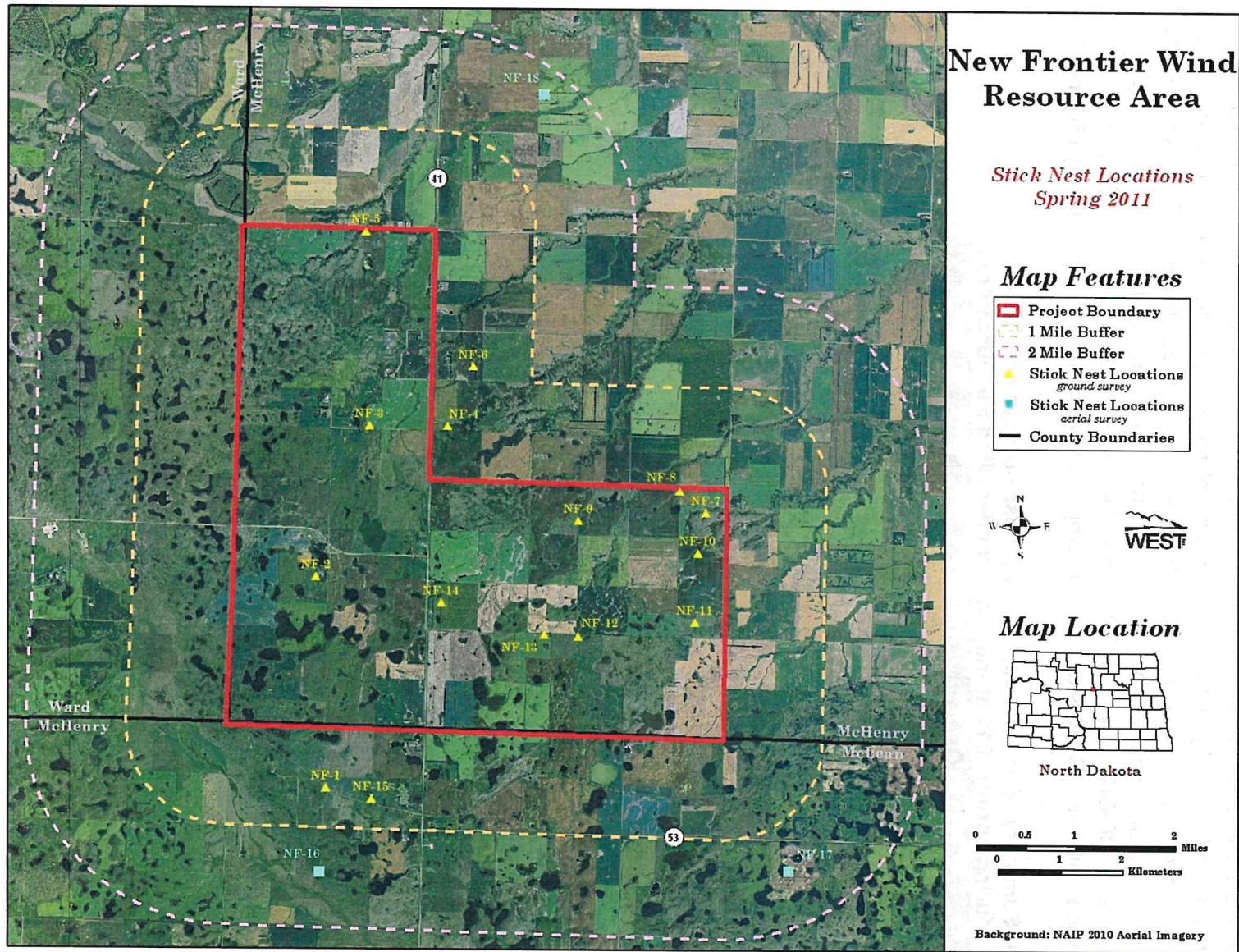


Figure 2. Potential raptor nest locations at the New Frontier Wind Resource Area during spring 2011.

## RESULTS

### Aerial Sharp-tailed Grouse Lek Surveys

Approximately 185.5 km (115.3 mi) of transects were surveyed during three time periods (April 11, April 26, and May 12). A total of 50 individual sharp-tailed grouse were observed during survey one; one during survey two; and 26 during survey three (Table 1). Three potential leks were identified; two during survey one and one during survey three (Table 1; Figure 1). Probable leks NF-GR3 and NF-GR4 were located outside of the NFWRA boundary in pastureland while NF-GR8 was observed in cropland within the NFWRA boundary (Figure 1).

**Table 1. Summary of aerial sharp-tailed grouse surveys conducted during spring 2011 at the New Frontier Wind Resource Area.**

Survey Period	Date	Observation		Number	
		ID	Total	Dancing	Lek*
1	4/11/2011	NF-GR10	2	0	no
		NF-GR8	10	4	probable
		NF-GR2	1	0	no
		NF-GR4	22	1	probable
		NF-GR1	3	0	no
		NF-GR5	12	0	no
2	4/26/2011	NF-GR6	1	0	unknown
3	5/12/2011	NF-GR3	18	6	probable
		NF-GR7	7	0	unknown
		NF-GR9	1	0	no

\*No = birds observed but no birds displaying and flushed birds flew off into distance

Unknown = no birds observed displaying but birds only flew a short distance when flushed, consistent with behavior when on a lek

Probable = birds observed displaying during one survey, consistent with a lek

Confirmed = birds observed displaying at same location during more than one survey, consistent with a lek

### Raptor Nest Surveys

A total of 18 potential raptor nests were observed in or within 3.2 km (2 mi) of the NFWRA (Table 2; Figure 2). None of these were large structures such as an eagle would use. Three nests were recorded during the aerial survey within the 3.2 km (2 mi) buffer (Figure 2). One (NF-17) was active (Table 2). Of the 15 nests observed during the ground survey, four were outside the project boundary (Figure 2) and none were active (Table 2). Of the 11 potential nests recorded within the NFWRA, three were active but species could not be determined (Table 2). The status of nest NF-8 was undetermined but a red-tailed hawk (*Buteo jamaicensis*) was perched next to the nest.

**Table 2. Summary of raptor nest surveys conducted during spring 2011 at the New Frontier Wind Resource Area.**

<b>Survey Type</b>	<b>Nest ID</b>	<b>Condition</b>	<b>Status</b>	<b>Species</b>
Aerial	NF-16	good	undetermined	probable red-tailed hawk
	NF-17	good	active	red-tailed hawk
	NF-18	good	inactive	
Ground	NF-1	poor	inactive	
	NF-2	good	inactive	
	NF-3	good	inactive	
	NF-4	fair	inactive	
	NF-5	fair	inactive	
	NF-6	good	inactive	
	NF-7	good	inactive	
	NF-8	good	undetermined	probable red-tailed hawk
	NF-9	fair	inactive	
	NF-10	good	inactive	
	NF-11	good	inactive	
	NF-12	good	active	unknown
	NF-13	good	active	unknown
	NF-14	good	active	unknown
	NF-15	good	inactive	

## **DISCUSSION**

### **Aerial Sharp-tailed Grouse Lek Surveys**

The start of aerial surveys was delayed one week due to persistent snow cover across the NFWRA. Forty percent of the NFWRA was estimated snow covered during the April 11 survey with snow still evident during the final (May 12) survey. Three probable lek locations were documented with displaying birds observed. In addition, it is possible that there is a lek in the vicinity of points NF-GR6 and NF-GR7 (Figure 1). These locations were recorded on separate surveys and although no courtship behavior was observed, the general behavior of birds (short flights when flushed) suggests these grouse may have been on a lek nearby. Sharp-tailed grouse were not observed at any location on more than one occasion. Cloudy and windy conditions on two of the three surveys may have affected sharp-tailed grouse detectability but to what extent is unknown.

## **Raptor Nest Survey**

Based on both ground and aerial surveys, it does not appear there were any large nest structures indicative of eagle nests in or within 3.2 km (2 mi) of the NFWRA. However, there are other raptor species stick nests indicating some level of raptor use of the wind resource area. All four of the active or likely active raptor nests were located within the NFWRA boundary and all were east of state Highway 41 (Figure 2). Access to the western boundary and southeast corner of the NWRA and buffer area was limited. Although scanned with a spotting scope, this area may contain other raptor nests. Species identification at active nests was hindered by distance from the nest to observer or visibility of the raptor in the nest. Based on observations while conducting various surveys in and around the NFWRA, our experiences conducting biological surveys throughout central North Dakota, and generally accepted ranges of various raptor species, red-tailed hawks are likely the most common species utilizing the observed nest. Swainson's hawks (*Buteo swainsoni*) could also commonly use these nest structures. Grassland habitat is present in and around the NFWRA and could provide suitable nesting habitat for the ground nesting northern harrier (*Circus cyaneus*). Northern harriers were observed during the field visit.

## **REFERENCES**

Derby, C., and T. Thorn. 2011. Tier II Site Characterization Study of the New Frontier Wind Resource Area. Prepared for Element Power US, LLC. Prepared by Western EcoSystems Technology, Inc. (WEST), Bismarck, North Dakota.

Martin, S.A. and F.L. Knopf. 1981. Aerial Survey of Greater Prairie Chicken Leks. Wildlife Society Bulletin 9(3): 219-221.