

**Lek Survey Results for the  
Crocker Wind Farm  
Clark County, South Dakota**

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**Prepared for:**

Geronimo Energy  
7650 Edinborough Way, Suite 725  
Edina, MN 55425

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**Prepared by:**

Western EcoSystems Technology, Inc.  
1710 Douglas, Suite 283  
Golden Valley, MN 55422

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## **STUDY PARTICIPANTS**

### **Western EcoSystems Technology**

Joyce Pickle  
Adam Kreger  
Chad Rittenhouse  
Jennifer Stucker

Project Manager  
Biologist/GIS Specialist  
Research Biologist  
Biologist

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## INTRODUCTION

Crocker Wind Farm, LLC (Project), a wholly owned subsidiary of Geronimo Energy, LLC (Geronimo) is proposing a wind energy project located in Clark County, South Dakota (Figure 1). Geronimo requested that Western EcoSystems Technology, Inc. (WEST) conduct an aerial lek survey to help evaluate the potential impacts of construction on greater prairie-chicken (*Tympanuchus cupido pinnatus*) and sharp-tailed grouse (*Tympanuchus phasianellus*). This report provides results of the lek surveys conducted at the Project on April 14 – May 12, 2016.

Greater prairie-chickens are a grassland-nesting, upland bird currently found in South Dakota, North Dakota, Minnesota, Wisconsin, Iowa, Illinois, Missouri, Oklahoma, Kansas, Colorado, and Nebraska. Once widely distributed from southern Canada to Texas, the greater prairie-chicken experienced a large reduction in population since European settlement (Johnson et al. 2011). Direct habitat loss due to conversion of native prairie to intensive cropland and overgrazing by domestic animals are primary factors in the population's initial decline (South Dakota Game, Fish and Parks [SDGFP] 2011). Over the past 50 years, greater prairie-chicken populations have increased 2.5% per year (95% confidence interval [CI]: -2.2, 6.1) in the United States and 9.4% per year (95% CI: -0.3, 24.6) in South Dakota (Sauer et al. 2014). In South Dakota, greater prairie-chickens are distributed nearly statewide, with greatest abundance in the central and northeastern portion of the state (Flake et al. 2010).

Sharp-tailed grouse are a grassland-nesting, upland bird with a current range extending from Michigan to Colorado and north to Alaska. While sharp-tailed grouse utilize a broader range of open lands than greater prairie-chickens, they too have experienced a large reduction in population since European settlement, largely due to hunting and habitat loss (Connelly et al. 1998). Over the past 50 years, sharp-tailed grouse populations have increased 0.7% per year (95% CI: -1.4, 2.6) in the United States and 4.9% per year (95% CI: 1.2, 9.6) in South Dakota (Sauer et al. 2014). Sharp-tailed grouse are distributed throughout South Dakota with lowest abundance in the southeastern portion of the state (Flake et al. 2010).

SDGFP developed a Prairie Grouse Management Plan with a goal to maintain greater prairie-chicken and sharp-tailed grouse populations and habitat consistent with the ecological, social, and aesthetic values of South Dakota citizens, while addressing the concerns and issues of residents and visitors of South Dakota (SDGFP 2011). The Prairie Grouse Management Plan provides six objectives and thirty-nine strategies to accomplish this goal, including objectives to maintain statewide grassland habitat acreage (Objective 1), monitor prairie grouse abundance (Objective 3), and evaluate research needs and priorities (Objective 4).

## STUDY AREA

The Project is located in Clark County, in southeast South Dakota, approximately 30 miles west of Watertown (Figure 1). The Project falls in the Northern Glaciated Plains level III

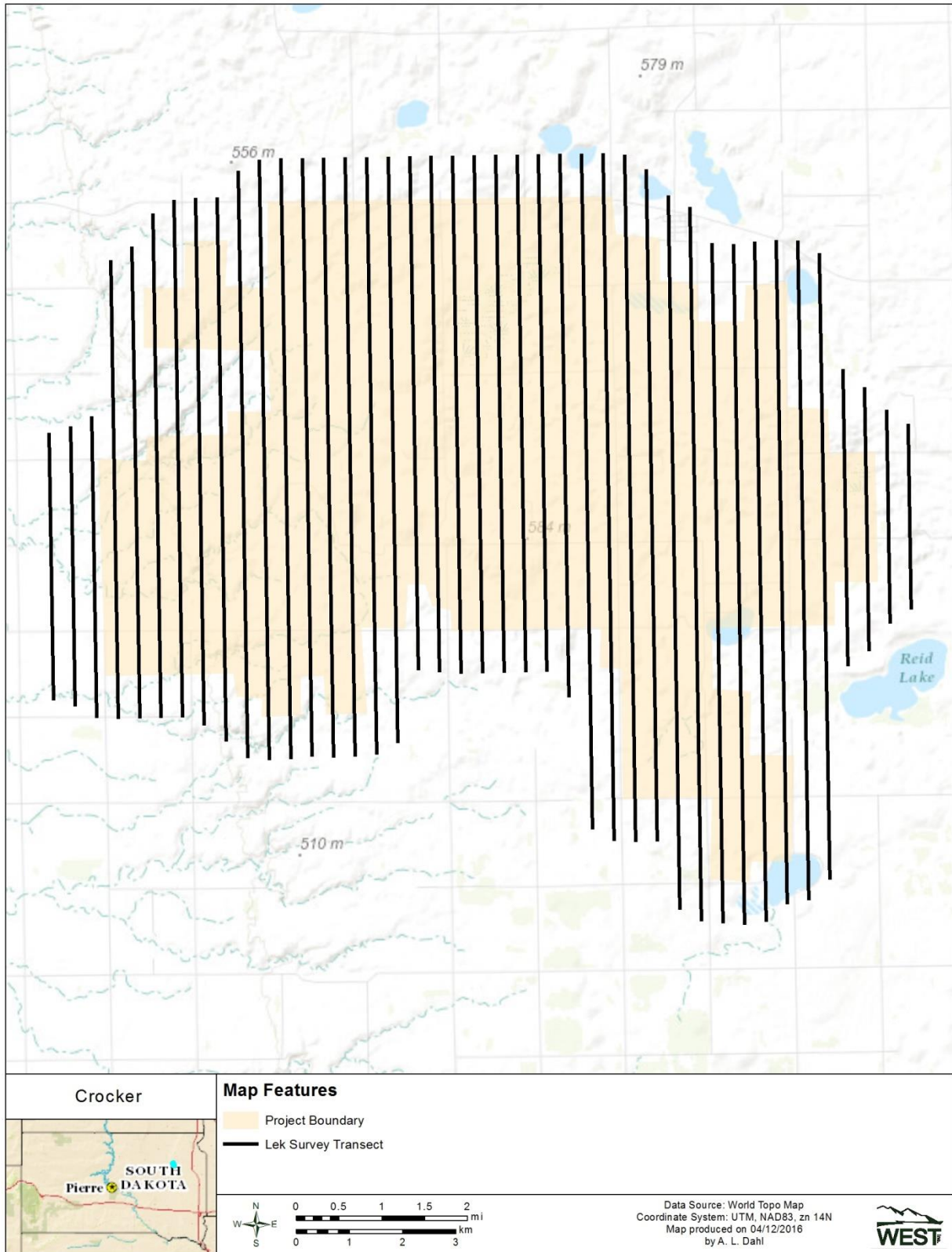


Figure 1. Location of the Crocker Wind Farm, Clark County, South Dakota, and lek survey transects surveyed April 25 – May 11, 2016.



ecoregion and the Prairie Couteau Escarpment (46l) and Prairie Couteau (46k) Level IV ecoregions (USEPA 2015). The Northern Glaciated Plains ecoregion is flat to gently rolling landscape of glacial drift. The region is transitional between tallgrass and shortgrass prairie and high concentrations of temporary and seasonal wetlands offer suitable habitat for waterfowl nesting and migration. The Prairie Couteau Escarpment rises in elevation approximately 300-600 feet from the Minnesota River to the top of the Prairie Couteau. Dense deciduous forest growth in riparian areas, along with cool perennial streams flowing off the escarpment, provides aquatic habitats not found elsewhere in eastern South Dakota. The Prairie Couteau is generally a higher elevation plateau with poorly defined drainage. Many lakes and a mix of row crops and pasture are present in this region. This region, previously dominated by shortgrass and tallgrass prairies, seasonal and semi-permanent wetlands, mixed tall shrubs, and riparian and oak-aspen groves, has been extensively converted to farmland and cropland, livestock production, and pasture lands (USEPA 2013).

## METHODS

WEST biologists conducted aerial surveys from a fixed-wing aircraft in April and early May (April 25 – May 11, 2016; Table 1), a period when greater prairie-chickens and sharp-tailed grouse would gather and display at leks, which are communal mating grounds. Prior to the surveys, WEST biologists obtained historic lek locations from SDGFP because lek locations are typically used for many years. Two experienced WEST biologists and a skilled pilot conducted low-elevation surveys along transects spaced 0.25 miles (mi; 0.4 km) throughout the Project (Figure 1), flying at speeds of 70 to 100 mi per hour (112 to 161 km per hour). WEST biologists recorded locations of all leks or individual grouse observed using a hand-held Global Positioning System (GPS), noted the species, and counted the number of individuals by sex when possible. Surveys were limited to the first three hours after civil daylight, and to days with winds <20 mi per hour (32 km per hour), no rain, and good visibility. Aerial surveys occurred twice along all transects of the survey, with a minimum of seven days between surveys. Although WEST biologists were available to start surveys on April 14, weather characteristics (rain, fog, snow and wind) prevented aerial surveys from starting until April 25.

**Table 1. Lek survey dates at the Crocker Wind Farm, Clark County, South Dakota, April 25 – May 11, 2016.**

Date	Time	Survey type	Notes
4/25/2016	06:36-07:37	Aerial	
4/25/2016	06:41-07:30	Aerial	
4/26/2016	06:22-06:54	Aerial	Ended early: fog
5/2/2016	05:58-08:18	Aerial	
5/9/2016	05:54-06:21	Aerial	Ended early: wind
5/11/2016	05:55-08:16	Aerial	Wind

## **RESULTS**

WEST biologists detected no greater prairie-chicken or sharp-tailed grouse leks within the Project after two rounds of surveys. While conducting aerial surveys, WEST biologists observed two sharp-tailed grouse flying approximately 0.75 mi west of the project boundary (Lat 45.058969°, Long -97.937644°) and one sharp-tailed grouse flying approximately 0.5 west of the project boundary (Lat 45.095535°, Long -97.921448°).

SDGFP records contained ten leks located one to five miles to the south and southwest of the Project boundary, in relatively flat terrain to the west of the Prairie Couteau. WEST biologists did not survey historic SDGFP lek locations since they were more than a mile from the Project boundary and their status is unknown for 2016.

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