



September 29, 2014

Mr. Patrick Smith, Director of Environmental Planning
Grande Prairie Wind, LLC
7650 Edinborough Way, Suite 725
Edina, Minnesota 55435

Subject: **Revised Technical Memorandum - Small White Lady's Slipper and Western Prairie Fringed Orchid Surveys**
Grande Prairie Wind Farm
Holt County, Nebraska

Dear Mr. Smith:

This memo presents the findings of the small white lady's slipper (*Cypripedium candidum*) and western prairie fringed orchid (*Platanthera praeclara*) surveys for the proposed Grande Prairie Wind Farm (the "Project"). Work was performed by Tetra Tech under contract to Grande Prairie Wind, LLC. The Project Area covers 118 square miles and its southwestern extent is located 10 miles northeast of O'Neill in Holt County, Nebraska. The Project will include construction of up to 266 turbines (dependent upon final turbine model selected) and associated access roads, electrical collection systems, substations, and a transmission line. Tetra Tech based these surveys on the Project layouts received between April 29, 2014 and May 29, 2014. The following appendices support this narrative:

Appendix A. Figures

1. Grande Prairie Wind Farm Project Area, Holt County, Nebraska
2. Habitat and Identification Guidance: Small White Lady's Slipper
3. Habitat and Identification Guidance: Western Prairie Fringed Orchid

Appendix B. Photographs of Typical Habitats Observed in the Field

Status, Distribution, Habitat, and Flowering Phenology

The small white lady's slipper is listed as a state threatened species in Nebraska. The western prairie fringed orchid is a federally and state threatened species in Nebraska. The estimated current range of both species includes part of Holt County, but this current range is located southwest of the Project Area (NGPC 2011). The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Plants Database shows that neither species is known to occur in Holt County (USDA, NRCS 2014). The NRCS Plants Database distribution maps include county level data compiled from verifiable information, including records of other agencies, published literature, and herbarium specimens.

Habitat for both species includes sedge meadows and mesic to wet prairies that have a constant source of reliable hydrology (USFWS 1996 and 2012, Olsson Associates 2012, Western Area Power Administration 2014). Both species tolerate and may benefit from light grazing or mowing, but neither species tolerates intensive grazing or over grazing.

The Nebraska Game and Parks Commission (NGPC) indicates the small white lady's slipper blooms at the end of May and early June (NGPC 2001). The NGPC indicates the western prairie fringed orchid blooms almost exclusively during the last week of June and the first two weeks of July (Associated

General Contractors of America 2007). The USFWS indicates the western prairie fringed orchid typically blooms in late-June to July, but has bloomed as early as the first of week of June in recent years (USFWS 2012).

Previous (2012) Surveys

Olsson Associates conducted surveys for the small white lady's slipper during May 15-18, 2012, and for the western prairie fringed orchid during June 4-8, 2012, by walking transects through areas of hydric soils in the "primary orchid survey area" (Appendix A, Figure 1) and several smaller tracts of suitable habitat. Olsson Associates defined the boundaries of the primary orchid survey area to include areas mapped or delineated as wetland and adjoining upland habitats that consisted mostly of grassland. Neither species of interest was detected during these initial surveys (Olsson Associates 2012).

Current (2014) Survey Methods

Tetra Tech conducted surveys for the small white lady's slipper and western prairie fringed orchid during the known flowering season of the two species in Nebraska. Two-person teams completed these surveys by walking transects spaced at 15-foot intervals in the 2014 orchid survey areas described below. These areas were surveyed during June 3-4 and on July 15, 2014 to cover the range of flowering phenology for the species of concern.

The 2014 orchid survey areas consisted of the part of the "jurisdictional waters delineation survey corridor" that overlapped the primary orchid survey area established in 2012 by Olsson Associates (Figure 1). The jurisdictional waters delineation survey corridor consisted of Project turbine, road, collection line, transmission line, and substation and laydown locations, plus adjoining buffers that ranged in width from 50 to 200 feet, as described in the Technical Memorandum on the Jurisdictional Waters Delineation. This survey corridor is shown on Figure 1.

Prior to completing the surveys, Tetra Tech biologists reviewed habitat and identification guidance for the two species (Appendix A, Figures 2 and 3). During the surveys, biologists continuously scanned the areas along the transects for plants meeting the species' descriptions. Surveyors were instructed to photograph any orchids found and to capture any orchid locations with sub-meter accuracy Trimble GPS technology.

The teams that completed the orchid surveys also conducted the wetland delineations throughout the Project survey corridor during June 3-10, June 24-July 1, and August 14-19, 2014. These wetland delineation surveys provided additional opportunities to detect occurrences of small white lady's slipper and western prairie fringed orchid in potentially suitable habitat.

Results

Tetra Tech encountered little habitat suitable for the small white lady's slipper and western prairie fringed orchid in the Project Area and did not detect either species of concern during the orchid and wetland delineation surveys. The lack of suitable habitat in the Project Area corresponds to the land use. The relatively flat southern and central portions of the Project Area are intensively used for agricultural crop production and have increasingly been converted to center-pivot irrigation in recent years. Remaining parts of the Project Area contain rolling hills with predominantly dry sandy soils, and are extensively grazed by beef cattle.

Plant communities typically associated with the species of concern are rare in the Project Area. Few of the species associated with small white lady's slipper and western prairie fringed orchid, which are listed

in the Project Draft Environmental Impact Statement (Western Area Power Administration 2014), were commonly encountered in the survey corridor. These species include big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), indiagrass (*Sorghastrum nutans*), and northern reedgrass (*Calamagrostis stricta*). Instead, much of the area surveyed for the species of concern was dominated by species such as Kentucky bluegrass (*Poa pretensis*), porcupine grass (*Stipa spartea*), downy brome (*Bromus tectorum*), junegrass (*Koeleria macrantha*), and white sage (*Salvia apiana*).

Literature Cited

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- NGPC (Nebraska Game and Parks Commission). 2011. Range maps for Nebraska's Threatened and Endangered Species – White Papers, Conference Presentations, & Manuscripts. Paper 30. <http://digitalcommons.unl.edu/nebgamewhitepap/30>.
- Olsson Associates. 2012. Wetland, Waterway and Habitat Evaluation: Grande Prairie Wind Farm, Holt County, State of Nebraska. Prepared for Grande Prairie Wind LLC by Olsson Associates, Mullen, NE. http://www.wapa.gov/ugp/Environment/documents/Grande_Prairie_Wind_Farm_Wetland_Waterway_and_Habitat_Evaluation.pdf.
- USDA, NRCS (U.S. Department of Agriculture, Natural Resources Conservation Service). 2014. The PLANTS Database (<http://plants.usda.gov>, 29 September 2014). National Plant Data Team, Greensboro, NC 27401-4901 USA.
- USFWS (U.S. Fish and Wildlife Service). 1996. *Platanthera praeclara* (western prairie fringed orchid) Recovery Plan. U.S. Fish and Wildlife Service, Ft. Snelling, Minnesota. <http://www.fws.gov/southdakotafieldoffice/wpfo%20recovery%20plan.pdf>.
- USFWS. 2012. Grande Prairie Wind Energy Development Northeast of the Town of O'Neill in Holt County, Nebraska: Comment letter dated December 17, 2012 to Mr. Matt Marsh, Western Area Power Administration. FWS-NE: 2012-419. http://www.wapa.gov/ugp/Environment/documents/Grande_Prairie_Wind_Farm_USFWS_Letter_Dated_121712.pdf.
- Western Area Power Administration. 2014. Draft Environmental Impact Statement : Interconnection of the Grande Prairie Wind Farm, Holt County, Nebraska. http://www.wapa.gov/ugp/Environment/documents/GrandePrairie_FinalDEIS_06032014.pdf.

Conclusion

Multiple surveys for small white lady's slipper and western prairie fringed orchid completed during the flowering season in potentially suitable habitat did not detect either species. Furthermore, these species were not detected during wetland delineation field work completed throughout the Project Area during the flowering season of these species by the biological survey staff who conducted the orchid surveys. These results are consistent with maps that show the estimated and known ranges of these species lie outside the

Grande Prairie Wind Farm Project Area and previous surveys conducted by others in 2012, which did not detect either species.

If you have questions or comments concerning this submittal, please feel free to contact our office at (612) 643-2224 or kim.gorman@ttratech.com.

Sincerely,

TETRA TECH

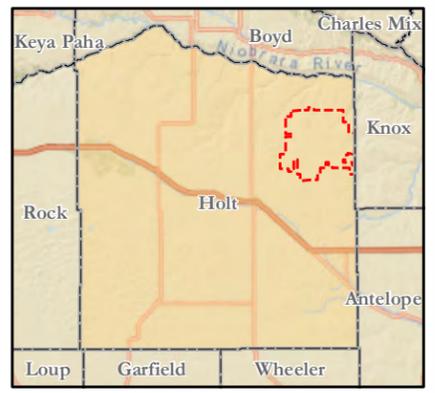
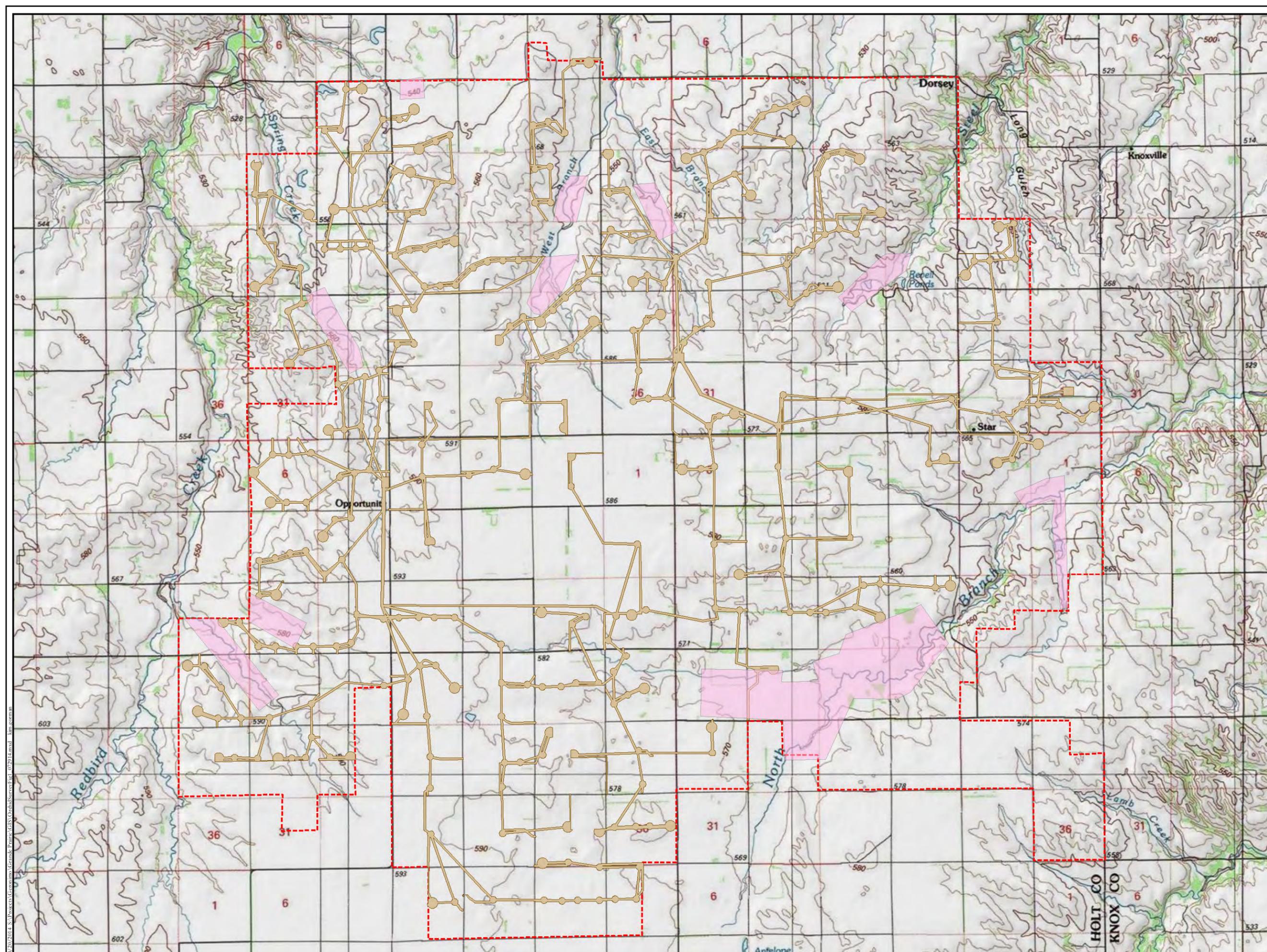
Handwritten signature of Robin P. Bouta in black ink, featuring a stylized 'R' and 'B' followed by a long horizontal line.

Robin P. Bouta, CSE, WDC
Senior Biologist

Handwritten signature of Kimberely Gorman in black ink, written in a cursive style.

Kimberely Gorman
Senior Project Manager

APPENDIX A: FIGURES 1 – 3



- Survey Corridor
- Primary Orchid Survey Area
- Project Boundary

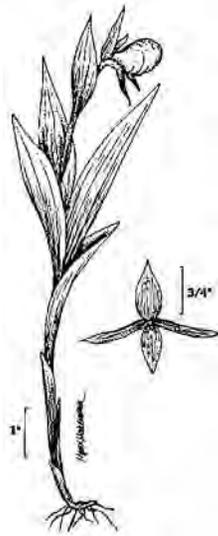


Grande Prairie Wind Farm Project
 Figure 1 - Project Area
 Holt County, Nebraska

Source: Map adapted from data provided by USA Topos, Project data provided by Geronimo Liney (April 29, 2014 through May 29, 2014) and Olson Associates Primary Orchid Survey Area (2012).

Small White Lady's Slipper (*Cypripedium candidum*)

Threatened



Habitat: Found in prairie openings, wooded grasslands, marshy areas, and sedge meadows; likes calcareous sandy loam soil with southern exposure. It will not be found in habitats with a history of livestock grazing or crop production. It is a shade intolerant species and therefore requires good sun exposure.

Description: Stem is 10-35cm tall with alternating leaves on the middle to upper half of the stem. Leaves are narrow-ovate to lance-elliptical or elliptical and are 5-15cm long and 2-6cm wide. The floral lip is an inflated white pouch sometimes containing faint purple veins or spots.

Protocol: Orchid surveys will be conducted in potential habitat within the portion of the Survey Corridor that overlaps the Primary Orchid Survey Area established in 2012 by Olsson Associates. These areas will be walked using 15 foot transects to identify orchids. The location of orchids identified during the surveys will be captured with Trimble GPS technology with sub-meter accuracy.

If you discover an orchid do the following:

1. Take a GPS point at the orchid location
2. Take pictures of the orchid
3. Record field notes of your location and characteristics of the surrounding area

Grande Prairie Wind Farm Project
Figure 2 – Habitat and Identification Guidance:
Small White Lady's Slipper
Holt County, Nebraska

Western Prairie Fringed Orchid (*Platanthera praeclara*)

Endangered



Habitat: Most likely found in remnant prairies, sedge meadows, and disturbed sites; likes moist to wet prairie areas.

Description: Single-stemmed with up to 25 showy flowers that are 2.5-4cm in length, each with a long nectar spur. The white flowers have lower petals that are three-lobbed and fringed. The single smooth stem can grow up to 85cm tall but is generally shorter. Lower leaves on the stem measure 9-15cm in length and 1.5-3.5cm in width. They are smooth and long and are larger than the upper leaves.

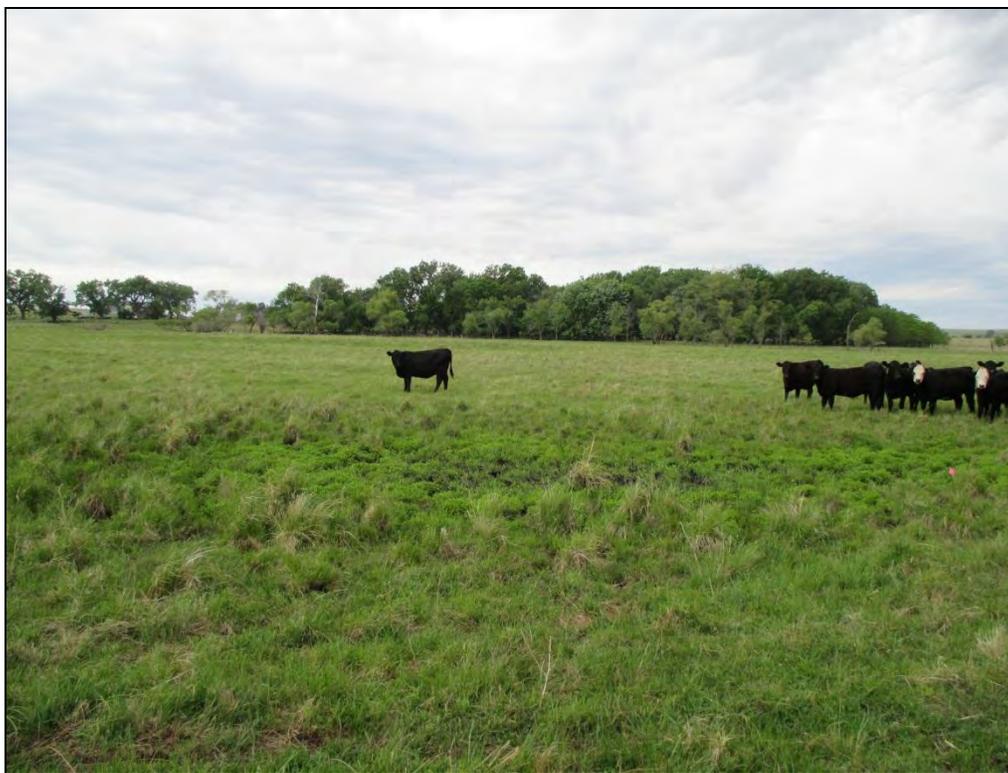
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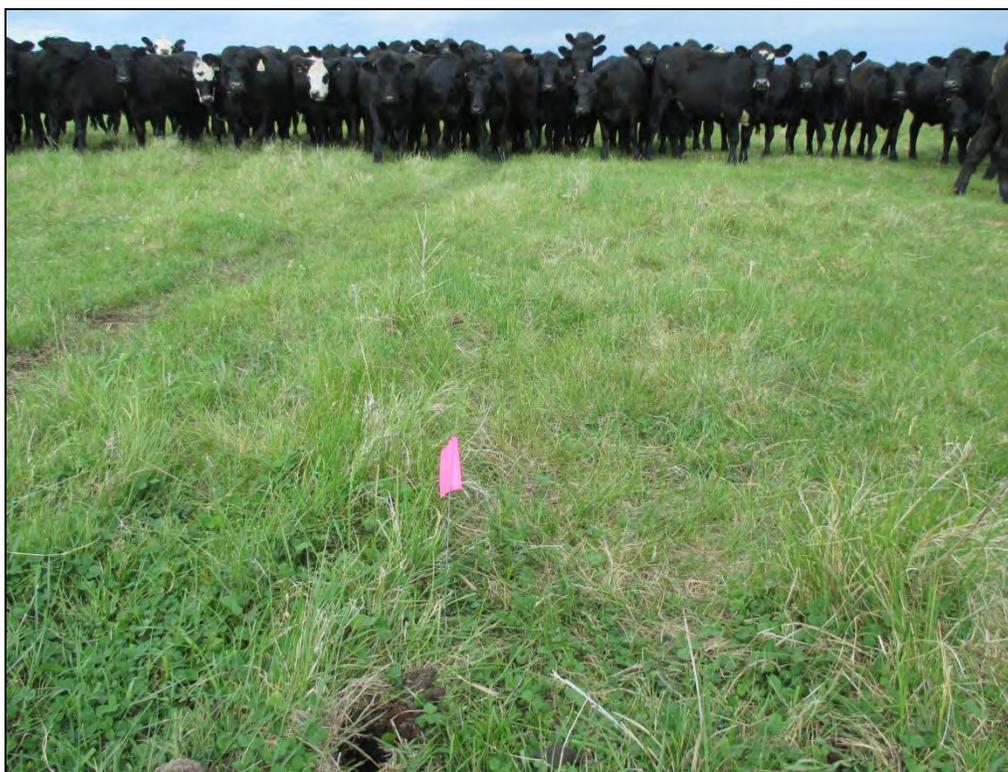
1. Take a GPS point at the orchid location
2. Take pictures of the orchid
3. Record field notes of your location and characteristics of the surrounding area

Grande Prairie Wind Farm Project
Figure 3 – Habitat and Identification Guidance:
Western Prairie Fringed Orchid
Holt County, Nebraska

**APPENDIX B: PHOTOGRAPHS OF TYPICAL HABITATS
OBSERVED IN THE FIELD**



Grazed wet meadow pasture in orchid survey area, June 3, 2014.



Grazed upland pasture in orchid survey area, June 3, 2014.



Previously grazed upland meadow in orchid survey area, June 4, 2014.



Previously grazed upland meadow in orchid survey area, June 4, 2014.



Overview of sedge meadow delineated near Spring Creek, June 10, 2014.



Close up view of sedge meadow delineated near Spring Creek, June 10, 2014.



Typical heavily grazed upland pasture, June 4, 2014.



Typical heavily grazed upland pasture, June 25, 2014.



Typical moderately grazed upland pasture, June 7, 2014.



Typical moderately grazed upland pasture, June 9, 2014.



Typical lightly grazed upland pasture dominated by porcupine grass, June 26, 2014.



Typical lightly grazed upland pasture dominated by porcupine grass, June 26, 2014.