

**Grassland Habitat Assessment
Badger Wind Farm, Logan and McIntosh Counties, North
Dakota**

Final Report



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TABLE OF CONTENTS

INTRODUCTION 1
PROJECT AREA 1
METHODS 1
 Desktop 1
 Field Survey 3
RESULTS 3
SUMMARY 3
REFERENCES 5

LIST OF TABLES

Table 1. Results of the grassland habitat survey conducted within the Badger Wind Farm in Logan and McIntosh counties, North Dakota. 3

LIST OF FIGURES

Figure 1. Location of the Badger Wind Farm, Logan and McIntosh counties, North Dakota..... 2
Figure 2. Results of the desktop review and field survey effort of grassland habitat types within the proposed Badger Wind Farm, Logan and McIntosh counties, North Dakota..... 4

LIST OF APPENDICES

Appendix A. Representative Landscape Photos Taken during Grassland Habitat Field Assessment Efforts at the Badger Wind Farm, Logan and McIntosh Counties, North Dakota.

INTRODUCTION

As part of the development of the Badger Wind Farm (Project) in Logan and McIntosh counties, North Dakota, Badger Wind Farm, LLC contracted Western EcoSystems Technology, Inc. (WEST) to map grasslands throughout the Project and assess those grasslands based on past tillage. This assessment can be used to help inform siting within the Project and to document grassland habitats. This report describes the results of the desktop grassland habitat assessment and field survey completed for the Project.

PROJECT AREA

The proposed Project encompasses 52,305 acres (ac; 21,167 hectares [ha]) in Logan and McIntosh counties, North Dakota (Figure 1). The primary land cover within the Project is predominately herbaceous (45.9%) and cultivated crops (44.2%; National Land Cover Database [NLCD] 2016). Topography within the Project is generally undulating topography (e.g., hilly topography) with an elevation range from 1,963.3 to 2,257.9 feet (598.4 to 688.2 meters; ESRI 2013).

METHODS

Desktop

WEST completed a desktop review of existing land cover features within the Project area using current aerial photography (US Department of Agriculture [USDA] National Agriculture Imagery Program [NAIP] 2019), existing land cover (NLCD 2016), and wetland (US Fish and Wildlife Service National Wetlands Inventory 2017) data, and North Dakota Game and Fish Department's (NDGFD) "Native Prairie" layer (NDGFD 2014), resulting in a digital data layer of polygons delineating grassland cover. Once all grassland areas were identified, each grassland area (polygon) was examined through a series of historical USDA NAIP aerial photography, ESRI imagery (larger scale/higher resolution; ESRI 2021), and North Dakota statewide historical imagery from 1957 – 1962 (USDA 2017) to help inform the grassland sod type (broken or unbroken). Unbroken sod or grassland (hereafter, unbroken) was identified based on the lack of disturbance evidence such as tillage, cultivation, or other forms of disturbance. North Dakota defines unbroken grasslands as "grasslands that have not been tilled or otherwise broken" (NDGFD 2021). Broken sod or grassland (hereafter, broken) was identified based on features such as rock piles indicating extensive mechanized rock clearing; presence and amount or height of trees and shrubs; field edge changes; absence of scattered rocks; straight line features indicating plowing, disking, harvesting, or planting; or any other features indicating human disturbance.

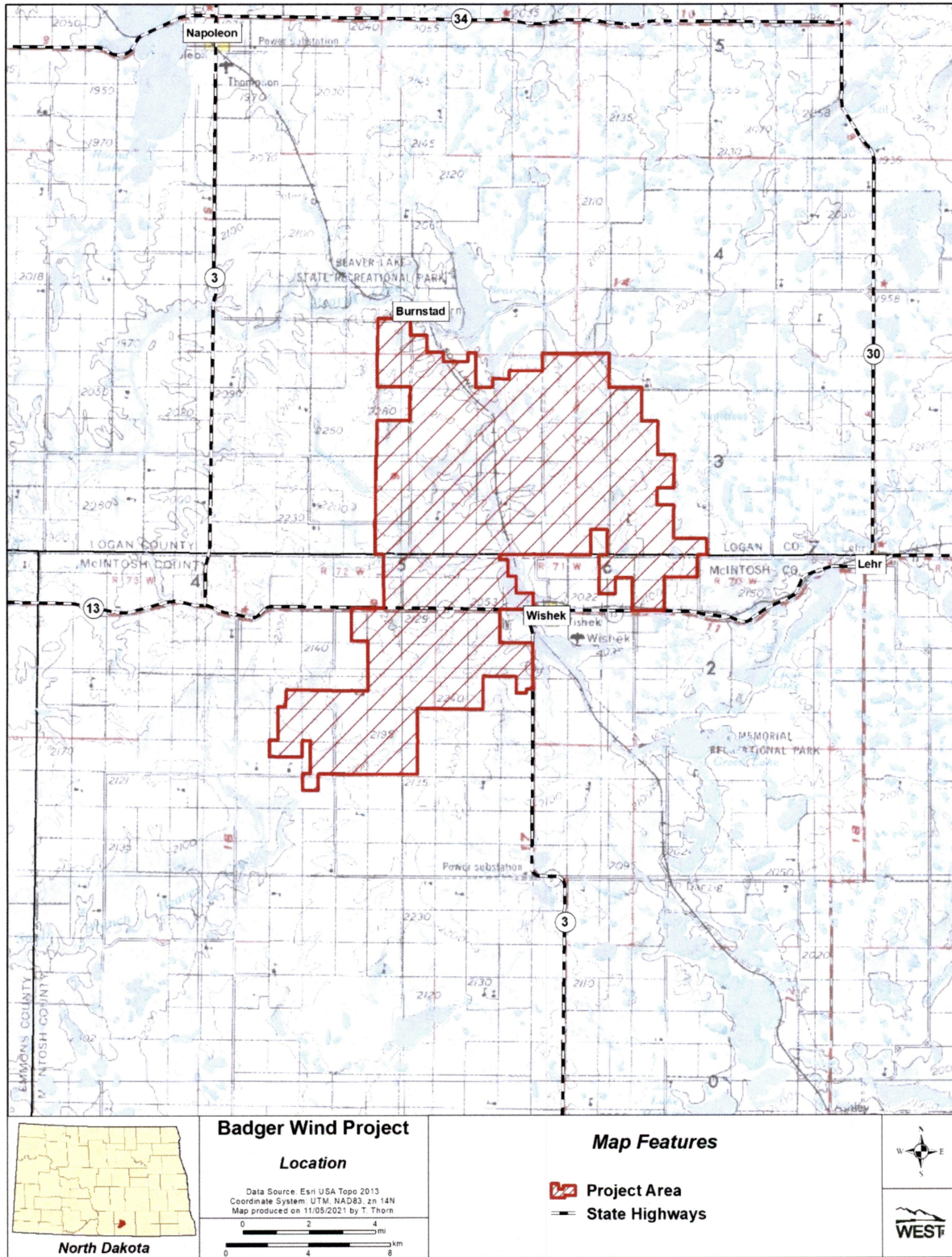


Figure 1. Location of the Badger Wind Farm, Logan and McIntosh counties, North Dakota.

Field Survey

Field surveys were completed to validate the desktop review of broken and unbroken grasslands. Each accessible grassland polygon created from the desktop exercise was confirmed broken or unbroken based on the characteristics identified in the field in addition to the vegetation composition of each polygon. Areas within grasslands with different land cover (e.g., wetland) were delineated on a map and digitized by a Geographic Information System specialist. Photographs were taken to document the condition (i.e., evaluated sod type) of the grassland polygon, where possible, as well as provide general representative landscape photos (Appendix A).

RESULTS

The desktop review resulted in 21,651.7 ac (8,762.1 ha), or 41.4% of the Project area (Figure 2), of potential grassland habitat within the Project area. Using a combination of the desktop reviews and field verification, we estimate approximately 3,188.7 ac (1,290.4 ha) of potentially broken grasslands and 18,463.0 ac (7,471.7 ha) of unbroken grassland (Table 1).

Table 1. Results of the grassland habitat survey conducted within the Badger Wind Farm in Logan and McIntosh counties, North Dakota.

Grassland Sod Type	Acres	Percentage of Total
Broken	3,188.7	14.7
Unbroken	18,463.0	85.3
Total	21,651.7	100

SUMMARY

Desktop analyses and field surveys were conducted for the Project area to classify grasslands as either broken or unbroken. This effort resulted in approximately 41.4% (21,651.7 ac) of the Project area composed of grasslands. Of these grasslands, 14.7% were classified as broken grasslands and 85.3% were classified as unbroken grasslands. Unbroken grassland is considered interchangeable with native prairie based on Best Management Practices definitions developed by NDGFD (2021). These unbroken grasslands are consistent with mixed-grass prairies associated with the Missouri Coteau (NDGFD 2021).

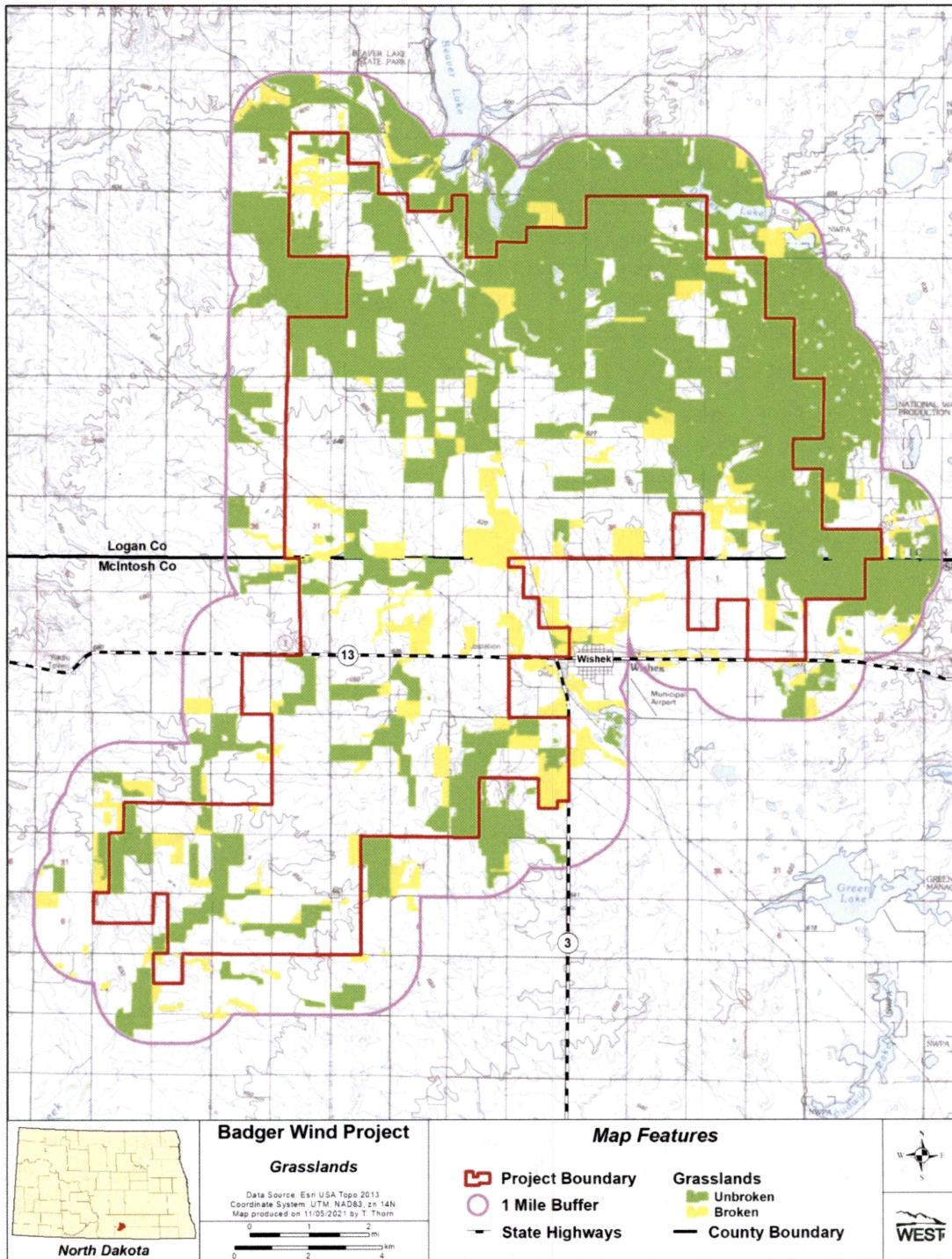


Figure 2. Results of the desktop review and field survey effort of grassland habitat types within the proposed Badger Wind Farm, Logan and McIntosh counties, North Dakota.

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Appendix A. Representative Landscape Photos Taken during Grassland Habitat Field Assessment Efforts at the Badger Wind Farm, Logan and McIntosh Counties, North Dakota.



Appendix A1. Representative photo of broken grasslands at the Badger Wind Farm, Logan and McIntosh counties, North Dakota.



Appendix A2. Representative photo of broken grasslands adjacent to cultivated crops at the Badger Wind Farm, Logan and McIntosh counties, North Dakota.



Appendix A3. Representative photo of unbroken grassland at the Badger Wind Farm, Logan and McIntosh counties, North Dakota.



Appendix A4. Representative photo of unbroken grassland at the Badger Wind Farm, Logan and McIntosh counties, North Dakota.