

**Wetland Mapping Survey  
Ruso Wind Project  
McHenry and Ward Counties, North Dakota**

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**Final Report**

**October 5 – 19 and November 29 – December 3, 2018, and  
May 29 – May 31, 2019**



**Prepared for**

**Ruso Wind Partners, LLC**

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## REPORT REFERENCE

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## **INTRODUCTION**

Ruso Wind Partners, LLC, a subsidiary of Southern Power Company is developing the Ruso Wind Project (Project) in McHenry and Ward counties, North Dakota (Figure 1). Ruso Wind Partners, LLC requested Western EcoSystems Technology, Inc. conduct a desktop and field wetland mapping survey within the Project area. The objective of the mapping survey was to identify wetlands, waterbodies, and streams within the proposed development areas to aid in siting Project infrastructure.

## **PROJECT AREA**

The Project area is located approximately 5.0 mi (8.0 km) north of the town of Ruso, North Dakota (Figure 1), encompassing approximately 17,571 acres (ac; 7,111 hectares [ha]). The Project topography is flat to rolling, with elevations ranging from 1,777.9 – 2,206.7 feet (ft; 541.9 – 672.6 meters [m]) above sea level (US Geological Survey [USGS] 2019). The Project occurs within the Missouri Coteau and Drift Plains Level IV Ecoregions (US Environmental Protection Agency [USEPA]; USEPA 2017). The Missouri Coteau Level IV Ecoregion is dotted with wetland depressions and is used for tilled agriculture and grazing (Bryce et al. 1996). The Drift Plains Level IV Ecoregion contains many temporary and seasonal wetlands and most of the landscape has been tilled due to its productive soil and relatively level topography (Bryce et al. 1996).

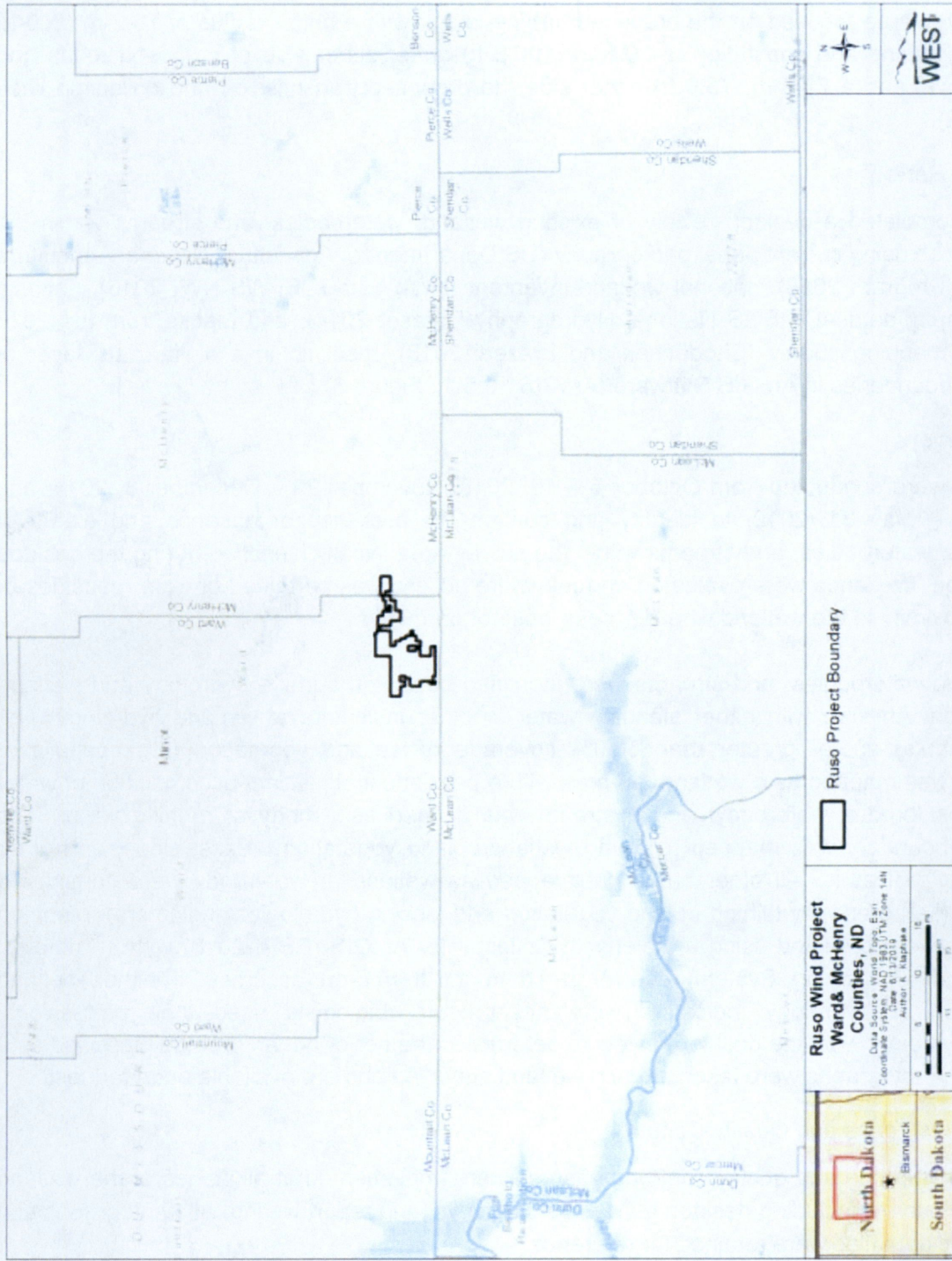


Figure 1. Location of the Ruso Wind Project in McHenry and Ward counties, North Dakota.

## **METHODS**

The survey area focused on the proposed turbine layout with a buffer radius of 76.2-m (300-ft) on each turbine and substation, a 30.5 m (100.0 ft) buffer either side of proposed roads and crane walk, and a 22.9 m (75.0 ft) either side the proposed transmission and collection lines (Figure 2).

### *Desktop Review*

WEST completed a desktop review of existing wetland, waterbodies, and streams within the survey area using current aerial photography (US Department of Agriculture National Agriculture Imagery Program 2018), national wetland inventory (NWI) data (USFWS NWI 2016), national hydrography dataset (USGS National Hydrography Dataset 2014), and results from the 2018 wetland mapping survey (Chodachek and Brazeal 2018), resulting in a digital data layer of wetland boundaries in ArcGIS Software (ArcGIS 10.5.1.; Figure 3).

### *Field Surveys*

Surveys were conducted from October 5 – 19, 2018, November 29 – December 3, 2018, and May 29 – May 31, 2019, to identify and confirm the presence or absence and extent of wetlands, waterbodies, and streams within the survey area initially identified during the desktop evaluation. Wetlands were evaluated on foot where access was permitted or from roadsides or close proximity to the wetland where access was not permitted.

Wetlands, waterbodies, and streams were identified based on surface hydrology and wetland vegetation. An area with either standing water or other indicators of wetland hydrology (i.e., water marks) and/or greater than 50.0% coverage of wetland vegetation (e.g., cattails or sedges) was mapped as a wetland; an area with a permanent significant accumulation of water was considered a waterbody; and a stream was defined as a body of running water. The wetland boundary was mapped following wetland/upland vegetation breaks, slope, and other hydrology indicators. All other areas not mapped as wetland or waterbody were considered uplands (i.e., areas containing upland vegetation and lacking hydrological indicators). Mapping and data were collected using a tablet with Collector for ArcGIS (ESRI 2018) with a Trimble® R1 Global Positioning System receiver rated to 1.6-ft (0.5-m) accuracy. If either wetland vegetation or hydrology indicators were not present, biologists used their professional judgement along with the desktop review to determine whether or not an area be classified as a wetland. Photographs were taken at each wetland surveyed and are available upon request.

### *Quality Assurance and Quality Control*

Quality assurance and quality control measures were implemented at all stages of the wetland mapping survey, including desktop review, field surveys, and report writing. All photographs and electronic data files were retained for reference.

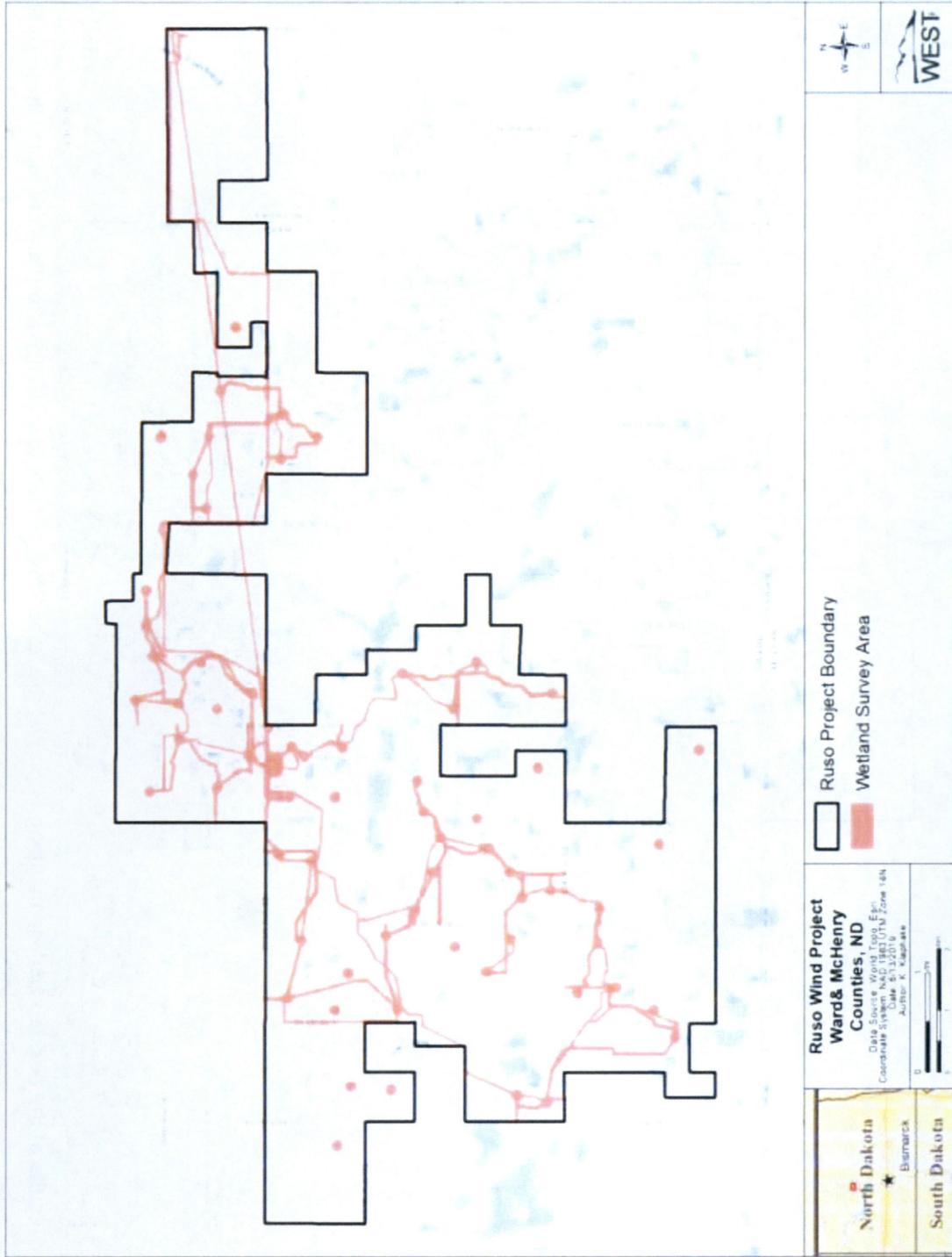


Figure 2. Overview of the wetland survey areas at the Ruso Wind Project in McHenry and Ward counties, North Dakota.

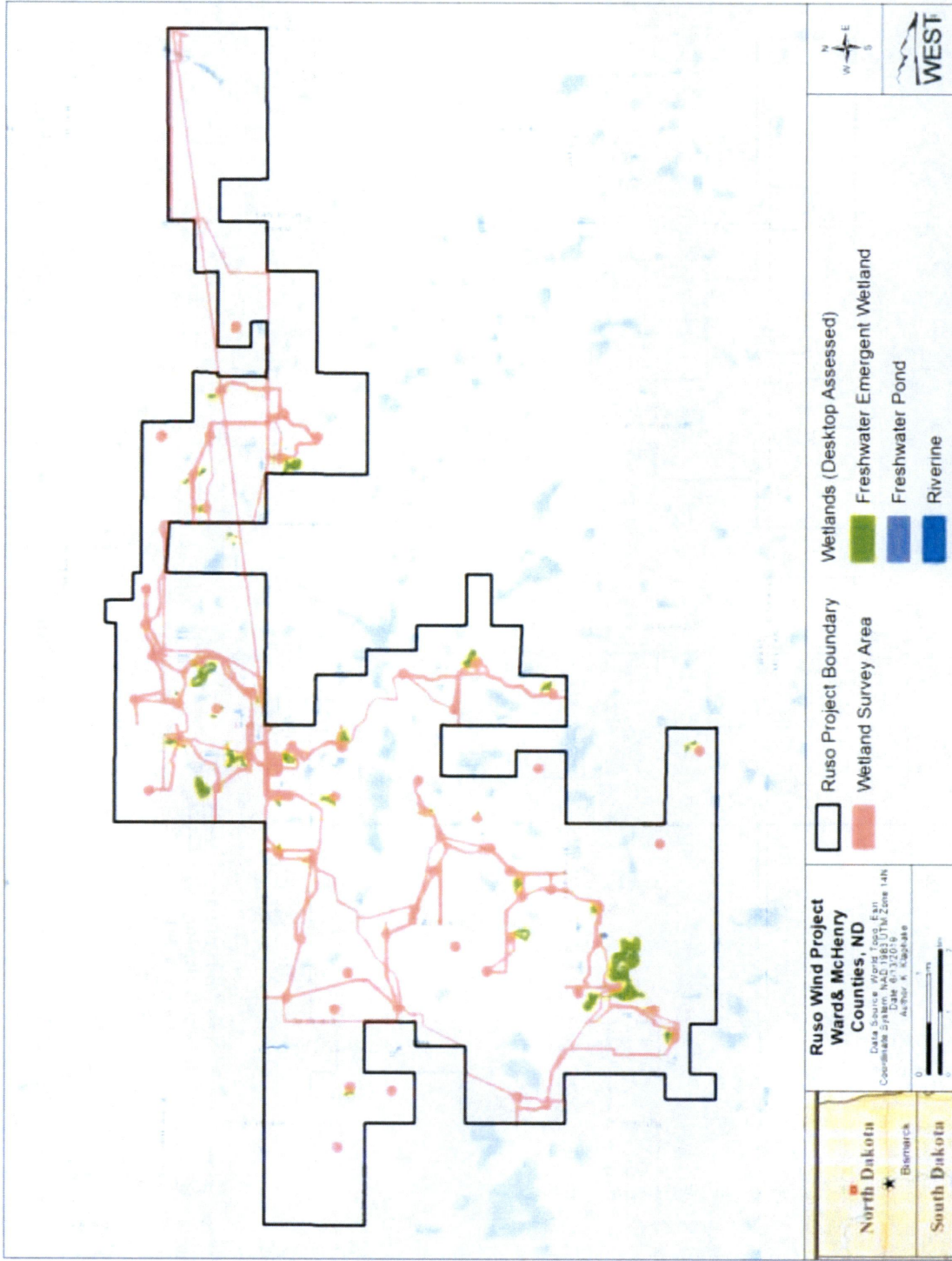


Figure 3. Results of the desktop wetland mapping survey at the Ruso Wind Project in McHenry and Ward counties, North Dakota.

## RESULTS

### *Desktop Review and Field Surveys*

The wetland survey area determined a total of 35.60 ac (14.40 ha) of wetlands intersecting the wetland survey area. The entire basins of wetlands crossed, including that portion of a basin outside of the defined survey corridor was 211.33 ac (85.52 ha) and is shown in Figure 4 for visual representation due to the scale. Freshwater emergent wetlands (32.84 ac [13.29 ha]) were the dominant wetland type mapped within the survey area. Freshwater pond accounted for 2.76 ac (1.12 ha). The majority of wetlands were mapped on foot (i.e., walk-in; Figure 5).

The most common wetland vegetation recorded during wetland mapping surveys was broadleaf cattail (*Typha latifolia*), followed by prairie cord grass (*Spartina pectinata*; Appendix A). Broadleaf cattail was recorded at 44.8% of the 116 wetlands (Appendix A). Vegetation surrounding mapped wetlands included cropland or introduced cool season grasses (i.e., smooth brome [*Bromus inermis*], intermediate wheat grass [*Thinopyrum intermedium*]).

Primary hydrologic field indicators included surface water, saturated soils, and water marks, were used in determining wetland boundaries during the wetland mapping survey.

### *Geospatial Data*

A shapefile was created based on the wetland survey to describe wetlands assessed during the desktop review and field surveys. Attribute data are described in Table 1.

**Table 1. Attributes and definitions for the wetland mapping survey shapefile based on field surveys conducted from October 5 – 19, November 29 – December 3, 2018, and May 29 – May 31, 2019 at the Ruso Wind Project in McHenry and Ward Counties, North Dakota.**

<b>Attribute</b>	<b>Definition</b>
WETLAND_TY	Wetland type (i.e., Freshwater Emergent, Freshwater Pond, Lake, No Wetland)
Evaluation	Survey type (i.e., Walk-In, Visual)
Acres	Area of wetland polygon in acres.

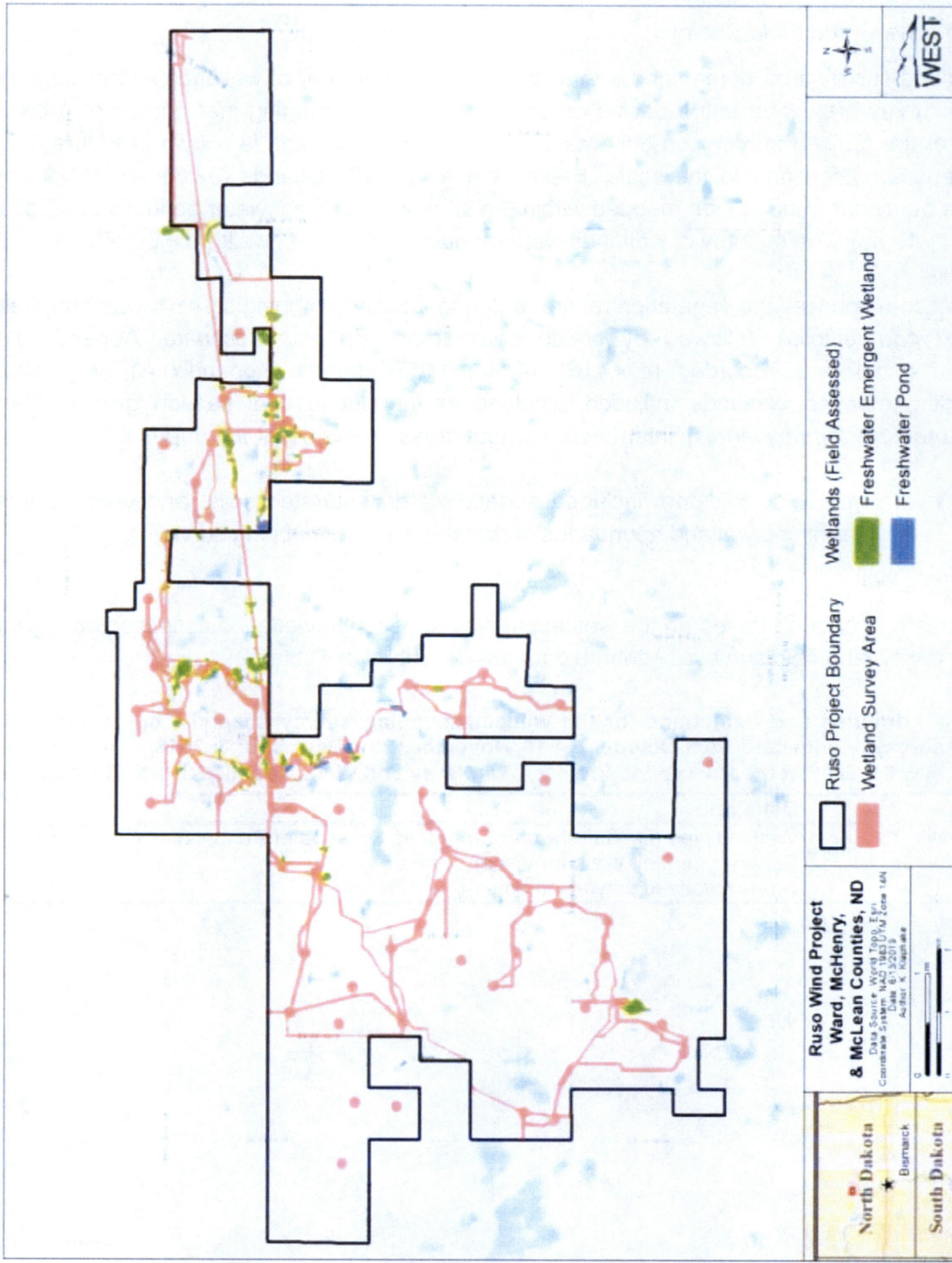


Figure 4. Results of the wetland mapping surveys conducted October 5 – 19, November 29 – December 3, 2018, and May 29 – May 31, 2019, at the Ruso Wind Project in McHenry and Ward counties, North Dakota.

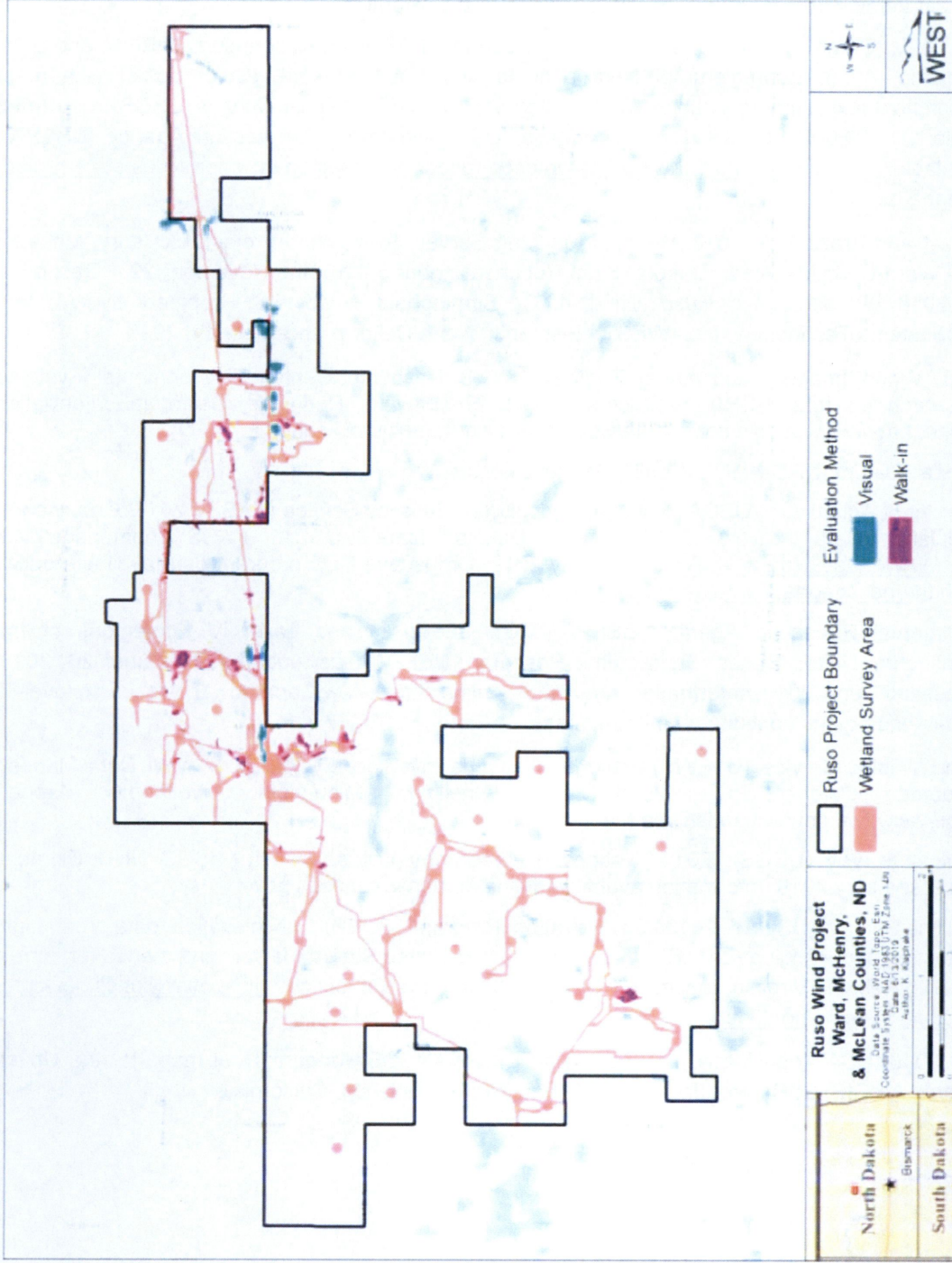


Figure 5. Survey type used during field surveys conducted October 5 – 19, November 29 – December 3, 2018, and May 29 – May 31, 2019, at the Ruso Wind Project in McHenry and Ward counties, North Dakota.

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**Appendix A. Summary of wetland vegetation recorded during field surveys conducted  
October 5 – 19, November 29 – December 3, 2018, and May 29 – May 31, 2019, at the Ruso  
Wind Project in McHenry and Ward counties, North Dakota.**

**Appendix A. Summary of wetland vegetation<sup>1</sup> recorded during field surveys conducted May 29 – May 31, 2019, at the Ruso Wind Project in McHenry and Ward counties, North Dakota.**

<b>Wetland ID</b>	<b>Evaluation Method</b>	<b>Wetland Type</b>	<b>Primary Vegetation</b>	<b>Secondary Vegetation</b>	<b>Tertiary Vegetation</b>
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail		Reed Canary Grass *
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	Prairie Cord Grass *	
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail		*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail		*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	Other	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	Other	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	Baltic Rush	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	River Bulrush	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	Spiny Naiad	River Bulrush
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	River Bulrush	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	Lake Sedge	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	Prairie Cord Grass	Foxtail Barley *
	Walk-in	Freshwater Pond	Broadleaf Cattail	*	*
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail		
	Walk-in	Freshwater Emergent Wetland	Broadleaf Cattail	*	*

<sup>1</sup> – Vegetation only recorded for walk-in surveys  
\* – No wetland vegetation observed when denoted by \*

Appendix A continued. Summary of wetland vegetation<sup>1</sup> recorded during field surveys conducted May 29 – May 31, 2019, at the Ruso Wind Project in McHenry and Ward counties, North Dakota.

Wetland ID	Evaluation Method	Wetland Type	Primary Vegetation	Secondary Vegetation	Tertiary Vegetation
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	Prairie Cord Grass	Slough Sedge
Walk-in		Freshwater Pond	Broadleaf Cattail	Sago Pondweed	Prairie Cord Grass
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	Prairie Cord Grass	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	Sago Pondweed	Blunt Spikerush
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	River Bulrush	Sago Pondweed
Walk-in		Freshwater Pond	Broadleaf Cattail	Lake Sedge	Sago Pondweed
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	Sago Pondweed	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	Prairie Cord Grass	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	Prairie Cord Grass	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	Prairie Cord Grass	Other
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	Prairie Cord Grass	Baltic Rush
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	Prairie Cord Grass	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	Prairie Cord Grass	Sow Thistle
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	*	*
Walk-in		Freshwater Emergent Wetland	Broadleaf Cattail	Reed Canary Grass	*
Walk-in		Freshwater Emergent Wetland	Other	*	*

<sup>1</sup> – Vegetation only recorded for walk-in surveys

\* – No wetland vegetation observed when denoted by \*



Appendix A continued. Summary of wetland vegetation<sup>1</sup> recorded during field surveys conducted May 29 – May 31, 2019, at the Ruso Wind Project in McHenry and Ward counties, North Dakota.

Wetland ID	Evaluation Method	Wetland Type	Primary Vegetation	Secondary Vegetation	Tertiary Vegetation
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Pond	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Walk-in	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*
	Visual	Freshwater Emergent Wetland	*	*	*

<sup>1</sup> – Vegetation only recorded for walk-in surveys  
 \* – No wetland vegetation observed when denoted by \*

**Appendix A continued. Summary of wetland vegetation<sup>1</sup> recorded during field surveys conducted May 29 – May 31, 2019, at the Ruso Wind Project in McHenry and Ward counties, North Dakota.**

<b>Wetland ID</b>	<b>Evaluation Method</b>	<b>Wetland Type</b>	<b>Primary Vegetation</b>	<b>Secondary Vegetation</b>	<b>Tertiary Vegetation</b>
	Visual	Freshwater Emergent Wetland			
	Visual	Freshwater Emergent Wetland			
	Visual	Freshwater Emergent Wetland			
	Visual	Freshwater Emergent Wetland			
	Visual	Freshwater Emergent Wetland			
	Visual	Freshwater Emergent Wetland			
	Visual	Freshwater Emergent Wetland			
	Visual	Freshwater Emergent Wetland			
	Visual	Freshwater Emergent Wetland			

<sup>1</sup> – Vegetation only recorded for walk-in surveys

\* – No wetland vegetation observed when denoted by \*