2017 Grassland Breeding Bird Surveys
Emmons-Logan Wind Energy Center and 230 kV Transmission Line
Emmons and Logan Counties, North Dakota

Final Report

Prepared for:

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August 7, 2018

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EXECUTIVE SUMMARY

Emmons Logan Wind, LLC (Emmons Logan Wind) has proposed a wind energy facility in south-central North Dakota. Emmons Logan Wind tasked Western Ecosystems Technology, Inc. (WEST) to conduct surveys and monitor wildlife resources in the Emmons-Logan Wind Energy Center and 230 kV Transmission Line (Project) to estimate the impacts of construction and operation of the proposed Project on birds. The principal objective of the study was to document avian species use of the Project area by grassland nesting species. This report contains the results for the breeding bird surveys conducted by WEST in the summer of 2017.

Ten pairs of transects (20 total transects) were established in grasslands throughout the Project area. Surveys were conducted at each transect three times between June 7 and July 8, 2017. Thirty bird species were identified, with 883 individual bird observations within 817 separate groups were recorded. Cumulatively, three species comprised 77.5% of the individual observations: Savannah sparrow, chestnut-collared longspur, and western meadowlark. All other species comprised less than 3.0% of the observations individually.

Overall mean bird use recorded during transect surveys was 14.72 birds/transect/survey. Mean use was highest for passerines (13.65 birds/transect/survey) compared to any other bird type; passerines were observed on 100% of surveys and composed 92.8% of overall use. The grassland/sparrows subtype made up the majority of the passerines observations.

Eleven Species of Conservation Priority for North Dakota were observed, including the Sprague's pipit, and several species of habitat fragmentation concern. No federally listed species or eagles were recorded during breeding bird surveys.

STUDY PARTICIPANTS

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REPORT REFERENCE

Derby, C., S. Agudelo, and T. Thorn. 2018. 2017 Grassland Breeding Bird Surveys, Emmons-Logan Wind Energy Center and 230 kV Transmission Line, Emmons and Logan Counties, North Dakota. Prepared for Emmons-Logan Wind, LLC. Prepared by Western EcoSystems Technology, Inc. (WEST), Bismarck, North Dakota.

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INTRODUCTION

Emmons-Logan Wind, LLC (Emmons-Logan Wind), a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC, has proposed a wind energy facility in south-central North Dakota (Figure 1). Emmons-Logan Wind tasked Western Ecosystems Technology, Inc. (WEST) to conduct surveys and monitor wildlife resources in the Emmons-Logan Wind Energy Center and 230 kV Transmission Line (Project). The principal objective of the study was to document avian species use of the Project area by grassland nesting species. This report contains the results for the breeding bird surveys conducted by WEST in the summer of 2017.

PROJECT AREA

The approximately 75,375-acre (ac; 30,503-hectare [ha]) Project is located in Emmons and Logan counties, North Dakota, eight miles (mi; 13 kilometers [km]) northeast of the town of Linton (Figure 1). The majority of the Project area falls within the Northwestern Glaciated Plains Level III Ecoregion (US Environmental Protection Agency 1998) in an area of flat to gently rolling topography, with elevations ranging from 584 to 663 meters (m; 1,916 to 2,175 feet [ft]) above mean sea level.

Predominant land uses in the region are cultivated agriculture and cattle ranching (Bryce et al. 1996). Based on US Geological Survey (USGS) National Land Cover Data (NLCD; USGS 2011) in the Project area, grassland/herbaceous cover (42,506.2 ac [17,201.6 ha]) and cultivated crops (23,904.6 ac [9,538 ha]) are the major land cover types (56.4% and 31.6%, respectively) of the Project area. Pasture/hay composes 8.4% of the Project area with 6,297.7 ac (2,548.6 ha), while all other land cover types collectively comprise less than 4% (US; Homer et al. 2015). Based on desktop and field surveys conducted in 2017, WEST created a digitized grassland layer that identified 30,479.7 ac (12,334.7 ha) of grassland in the Project area of which 22,340.5 ac (9,040.9 ha; 73.3%) were classified as unbroken (native prairie) grassland and 8,139.2 ac (3,293.8 ha; 26.7%) as broken grassland (WEST 2018).

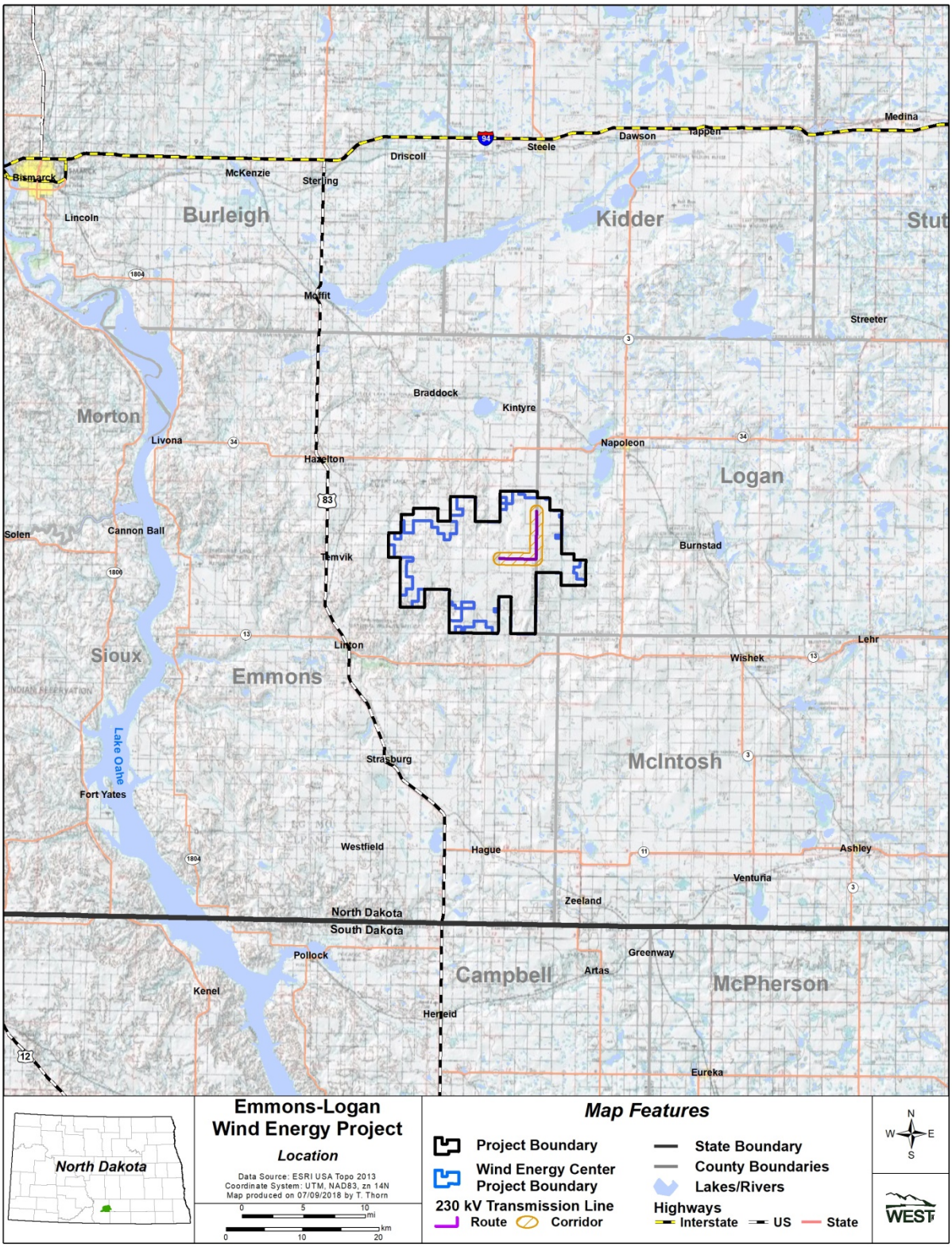

Figure 1. Location of the Emmons-Logan Wind Energy Center and 230 kV Transmission Line in Emmons and Logan Counties, North Dakota.

METHODS

Transect bird use surveys

The objectives of the transect bird use surveys were to identify grassland breeding bird use within the Project area.

Study Design

Ten pairs (20 total) pre-determined line-transects were established in areas planned for construction, and were placed systematically based on a random starting point, using turbine locations as proposed in spring 2017 as "anchor points" for one end of each transect (Figure 2). Paired transects were approximately 1,312.3 ft (400 m) long (total of 2,624.7 ft [800 m]) for each pair of transects), included eight blocks (total of 16 blocks for each pair of transects), and were located in predominantly grassland habitat, with a focus on unbroken sod grassland (i.e., native prairie). General habitat categories were developed and each 160-ft (50-m) block was categorized by habitat type.

Observers slowly walked along the paired transects, recording all birds that were observed or heard within approximately 160 ft (50 m) on either side of the transect line (total viewshed of 328 ft [100m]). Surveyors recorded observations for 160-ft (50-m) segments along each transect. The "block" for which birds were recorded was 160 ft (50 m) long (as the surveyor moved along the transect) by 320 ft (100 m) wide (160 ft [50 m] on either side of the transect).

In addition to the species observed and location (block and distance from observer and perpendicular distance from transect), the following data were recorded for each transect survey: date, start and end time of observation period, transect identification number, bird species or best possible identification, number of individuals, behavior, flight height and direction when first observed, and auditory-only observations. Weather information such as temperature, wind speed, wind direction, precipitation, and cloud cover, were also recorded for each transect survey. Transects were established, relocated, and followed using markers and Global Positioning System units.

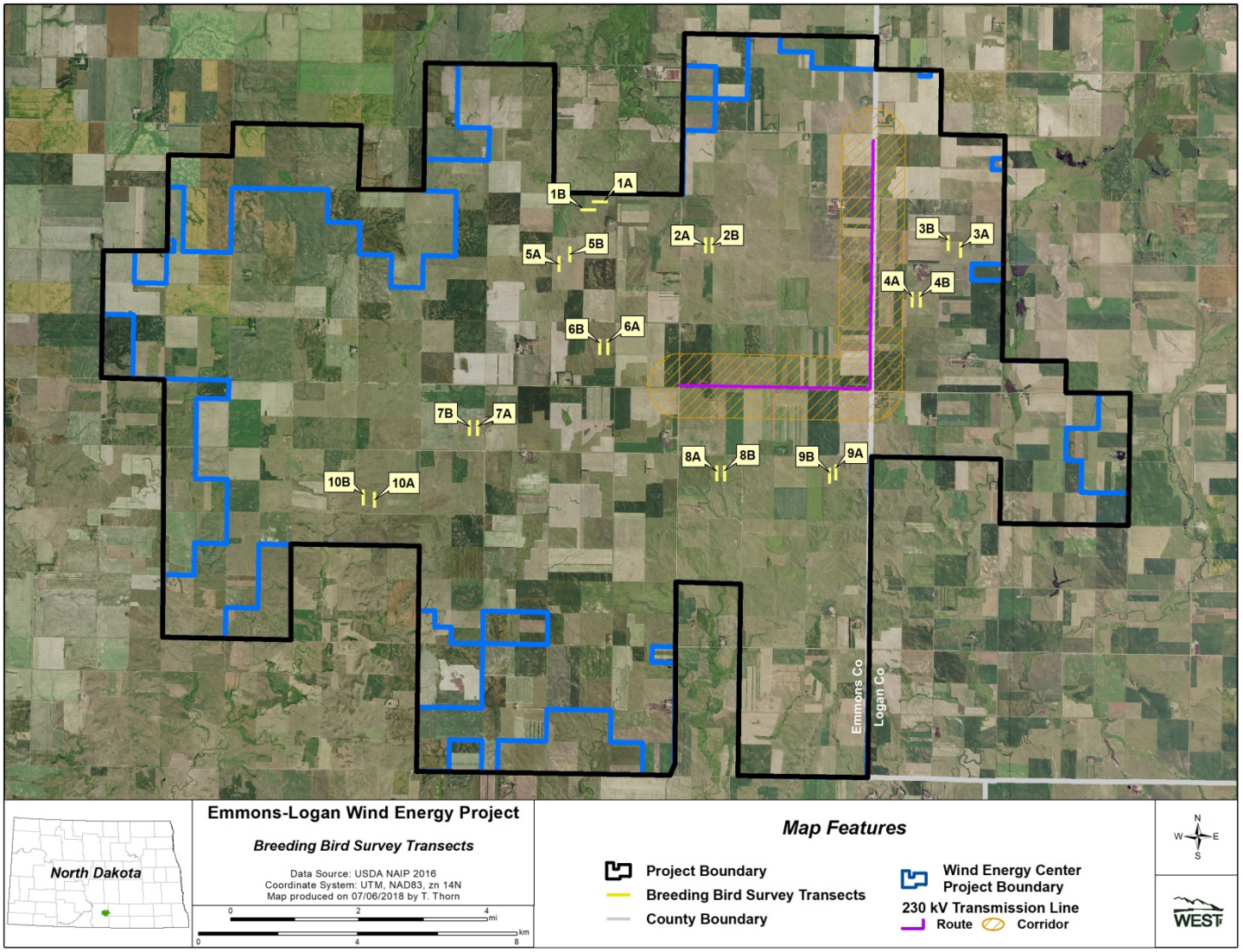

Figure 2. Transects surveyed during the breeding bird use surveys conducted at the Emmons-Logan Wind Energy Center and 230 kV Transmission Line in Emmons and Logan counties, North Dakota, from June 7 – July 8, 2017.

Observation Schedule

Each of the transects was surveyed three times from June 7 to July 8, 2017. Surveys were conducted from sunrise to 10:00 a.m. All species observed by sight or sound were recorded.

Statistical Analysis

For analysis purposes, a visit was defined as the required length of time, in days, to survey all of the transects once within the Project area. Visits were assigned according to the following rules: 1) a single visit had to be completed in a single season, and 2) a visit could be spread across multiple dates, but a single date could not contain surveys from multiple visits. Three visits were conducted during the study period (first visit from June 7 to June 10, second visit from June 19 to June 21, and third visit from July 6 to July 8).

Quality Assurance and Quality Control

Quality assurance and quality control (QA/QC) measures were implemented at all stages of the study, including in the field, during data entry and analysis, and report writing. Following field surveys, observers were responsible for inspecting data forms for completeness, accuracy, and legibility. A sample of records from an electronic database was compared to the raw data forms and any errors detected were corrected. Irregular codes or data suspected as questionable were discussed with the observer and/or project manager. Errors, omissions, or problems identified in later stages of analysis were traced back to the raw data forms, and appropriate changes in all steps were made.

Data Compilation and Storage

A Microsoft® MSSQL database was developed to store, organize, and retrieve survey data. Data were keyed into the electronic database using a pre-defined format to facilitate subsequent QA/QC and data analysis. All data forms, field notebooks, and electronic data files were retained for reference.

Transect Bird Surveys

Species lists, with the number of observations and the number of groups, were generated, including all observations of birds detected.

Species Diversity and Species Richness

Bird species diversity was defined as the total number of unique species observed. Species richness was calculated as the mean number of species recorded per transect survey (i.e., number of species/survey).

Bird Use, Percent of Use, and Frequency of Occurrence

Bird use estimates were standardized to number of birds/transect/survey. Mean use was calculated by determining the number of birds seen within 50 m (160 ft) on either side of the transect (100 m [328 ft] viewshed) for each given visit and then averaging by the number of

transects surveyed during that visit. A second averaging occurred across the number of visits during the entire study period.

Percent of use was calculated as the proportion of the overall mean use for a particular bird type or species. The frequency of occurrence was calculated as the percent of surveys in which a particular bird type or species was observed. Frequency of occurrence and percent of use provide relative estimates of species use of the proposed Project area. For example, a species may have high use estimates based on just a few observations of large groups; however, if the species occurs during very few of the surveys (low frequency of occurrence), the species may be less likely to use the proposed Project area.

Sensitive Species

North Dakota does not have an endangered or threatened species list but rather a list of Species of Conservation Priority (SCP) which includes mammals, reptiles, amphibians, fish, and freshwater mussels (Dyke et al. 2015). Species designated as a SCP by North Dakota Game and Fish Department (NDGFD) are placed in one of three Levels used to prioritize funding for State Wildlife Grant projects (Dyke et al. 2015). Level I (LI) SCP includes: 1) species in decline in North Dakota or across their range or 2) species with core breeding range within North Dakota. Level II (LII) SCP includes: 1) species of moderate conservation priority or 2) high level of conservation priority but with substantial non-SWG funding available. Federally threatened and endangered species are assigned Level II status. Level III (LIII) SCP includes species of moderate conservation priority that do not breed in North Dakota.

The U.S. Fish and Wildlife Service (USFWS) identifies wildlife species of habitat fragmentation concern (SHFC) in the Land-based Wind Energy Guidelines (Guidelines; USFWS 2012). The Guidelines state that a SHFC is a species of concern that when separation of their habitats into small blocks reduces connectivity and individuals suffer decreased survival, reproduction, distribution, or use of the area. In North Dakota, the USFWS has identified eleven bird species as SHFC (USFWS 2013).

RESULTS

Transect Use Surveys

Transect bird use surveys were conducted at the Project three times during the summer, for a total of 60 surveys conducted during the study period (Table 1).

Species Diversity and Species Richness

Thirty identified species (species diversity) were recorded during the transect use surveys and the species richness was 4.75 species/survey (Table 1). A total of 883 individual bird observations within 817 separate groups were recorded (Table 2). Cumulatively, three species (10.0% of all species) comprised 77.5% of the individual observations: Savannah sparrow (*Passerculus sandwichensis;* 354 observations), chestnut-collared longspur (*Calcarius ornatus*;

233 observations), and western meadowlark (*Sturnella neglecta*; 97 observations). All other species comprised less than 3% of the observations individually (Table 2).

Table 1. Summary of overall bird use (number of birds/transect[a]/survey), species richness (species/transect/survey), and sample size during breeding bird surveys conducted at the Emmons-Logan Wind Energy Center and 230 kV Transmission Line in Emmons and Logan Counties, North Dakota, from June 7 – July 8, 2017.

Season	# of Visits	Mean Use	Species Richness	Species Diversity	# Surveys Conducted
Overall	**3**	**14.72**	**4.75**	**30**	**60**

[a] 328-foot (ft; 100-meter[m]) viewshed (164-ft [50-m] on either side of transect)

Bird Use, Composition, and Frequency of Occurrence by Species and Type

Mean bird use estimates, percent of total use, and frequency of occurrence by bird type and subtype are shown in Table 3; estimates by individual species are shown in Appendix A. Mean bird use recorded during transect surveys was 14.72 birds/transect/survey.

Waterfowl

Mean waterfowl use was 0.37 birds/transect/survey, largely due to use by Canada goose (*Branta canadensis*). Waterfowl composed 2.5% of overall use and were observed in 5.0% of surveys (Table 3, Appendix A).

Shorebirds

Five shorebird species were recorded during surveys, resulting in a use of 0.28 birds/transect/survey. Upland sandpiper (*Bartamia longicauda*) had the highest mean use (0.13 bird/transect/survey) compared to any other shorebird species (Appendix A). Shorebirds composed 1.9% of overall use and were observed in 21.7% of surveys (Table 3).

Diurnal Raptors

Diurnal raptor use was 0.08 birds/transect/survey; diurnal raptors composed 0.6% of overall bird use and were observed in 8.3% of surveys (Table 3). Red-tailed hawk (*Buteo jamaicensis*) and Swainson's hawk (*Buteo swainsoni*) were the only diurnal raptor species included in analysis; mean bird use for these species was 0.07 and 0.02 birds/transect/survey, respectively (Appendix A). Red-tailed hawks accounted for 0.5% of overall bird use and were observed during 6.7% of surveys; a single Swainson's hawk observation (Table 2) accounted for 0.1% of overall bird use and was observed during 1.7% of surveys (Appendix A).

Upland Game Birds

Two upland game species (sharp-tailed grouse [*Tympanuchus phasianellus*] and ring-necked pheasant [*Phasianus colchus*]) were included in the analysis, resulting in a use of 0.17 bird/transect/survey. Upland game birds composed 1.1% of overall bird use and were observed in 15.0% of surveys (Table 3, Appendix A).

Table 2. Total number of groups and individuals for each bird type and species observed during breeding bird surveys conducted at the Emmons-Logan Wind Energy Center and 230 kV Transmission Line in Emmons and Logan counties, North Dakota, from June 7 – July 8, 2017.

Bird Type/Species	Scientific Name	# Groups	# Observations
Waterfowl		**3**	**22**
Canada goose	*Branta canadensis*	2	20
mallard	*Anas platyrhynchos*	1	2
Shorebirds		**17**	**17**
killdeer	*Charadrius vociferus*	4	4
marbled godwit	*Limosa fedoa*	1	1
upland sandpiper	*Bartramia longicauda*	8	8
willet	*Tringa semipalmata*	1	1
Wilson's snipe	*Gallinago delicata*	3	3
Diurnal Raptors		**5**	**5**
Buteos		*5*	*5*
red-tailed hawk	*Buteo jamaicensis*	4	4
Swainson's hawk	*Buteo swainsoni*	1	1
Upland Game Birds		**9**	**10**
ring-necked pheasant	*Phasianus colchicus*	6	6
sharp-tailed grouse	*Tympanuchus phasianellus*	3	4
Doves/Pigeons		**6**	**9**
mourning dove	*Zenaida macroura*	6	9
Passerines		**776**	**819**
Blackbirds/Orioles		*151*	*161*
bobolink	*Dolichonyx oryzivorus*	25	25
brown-headed cowbird	*Molothrus ater*	17	22
common grackle	*Quiscalus quiscula*	7	12
red-winged blackbird	*Agelaius phoeniceus*	5	5
western meadowlark	*Sturnella neglecta*	97	97
Flycatchers		*10*	*13*
eastern kingbird	*Tyrannus tyrannus*	6	8
western kingbird	*Tyrannus verticalis*	4	5
Grassland/Sparrows		*614*	*644*
chestnut-collared longspur	*Calcarius ornatus*	212	233
clay-colored sparrow	*Spizella pallida*	6	6
grasshopper sparrow	*Ammodramus savannarum*	6	6
horned lark	*Eremophila alpestris*	2	3
house sparrow	*Passer domesticus*	1	1
lark bunting	*Calamospiza melanocorys*	10	14
Savannah sparrow	*Passerculus sandwichensis*	354	354
Sprague's pipit	*Anthus spragueii*	4	4
unidentified sparrow	*NA*	16	20
vesper sparrow	*Pooecetes gramineus*	3	3
Swallows		*1*	*1*
barn swallow	*Hirundo rustica*	1	1
Woodpeckers		**1**	**1**
northern flicker	*Colaptes auratus*	1	1
Overall		**817**	**883**

Doves/Pigeons

Mourning dove (*Zenaida macroura*) was the only representative doves/pigeons species, resulting in a use of 0.15 birds/point/survey. Mourning doves composed 1.0% of overall use were observed in 10.0% of surveys.

Passerines

Mean use was highest for passerines (13.65 birds/transect/survey), mostly consisting of the subtype grassland/sparrows (10.73 birds/transect/survey; Table 3). Within passerines, Savannah sparrow (5.90 birds/transect/survey) and chestnut-collared longspur (3.88 birds/transect/survey) were the species with the highest mean use; for all other passerine species, use was less than two birds/transect/survey (Appendix A). Passerines composed 92.8% of overall use and were observed during 100% of surveys (Table 3).

Table 3. Mean bird use (number of birds/transect[a]/survey), percent of use (%), and frequency of occurrence (%) for each bird type and subtype observed during breeding bird surveys conducted at the Emmons-Logan Wind Energy Project and 230 kV Transmission Line in Emmons and Logan Counties, North Dakota, from June 7 – July 8, 2017.

Bird Type/Species	Mean Use	% of Use	% Frequency
Waterfowl	0.37	2.5	5.0
Shorebirds	0.28	1.9	21.7
Diurnal Raptors	0.08	0.6	8.3
Buteos	*0.08*	*0.6*	*8.3*
Upland Game Birds	0.17	1.1	15.0
Doves/Pigeons	0.15	1.0	10.0
Passerines	13.65	92.8	100
Blackbirds/Orioles	*2.68*	*18.2*	*83.3*
Flycatchers	*0.22*	*1.5*	*13.3*
Grassland/Sparrows	*10.73*	*72.9*	*100*
Swallows	*0.02*	*0.1*	*1.7*
Woodpeckers	*0.02*	*0.1*	*1.7*
Overall	**14.72**	**100**	

[a] 328-foot (ft; 100-meter [m]) viewshed (164-ft [50-m] on either side of transect)

Spatial Use

Mean use (birds/transect/survey) is presented by transect for all birds combined, and by bird types and subtypes (Figure 3, Appendix B). For all bird species combined, mean use was highest at Transect 3A (25.33 birds/transect/survey), followed by transects 10A and 10B (22.33 and 21.67 birds/transect/survey, respectively). Higher use at these transects was largely due to use by passerines (17.67, 21.33, and 19.67 birds/transect/survey, respectively), specifically the grassland/sparrow subtype. Mean use at all other transects ranged from nine to 17.67 birds/transect/survey, and was also largely due to use by passerines, specifically the grassland/sparrow subtype (Figure 3, Appendix B). Raptors were observed at only five of the 20 transects surveyed (2A, 7B, 8A, 9A, and 10A); mean raptor use was 0.33 birds/transect/survey at those transects (Appendix B). Shorebirds were observed at 10 of the transects while waterfowl were only observed at two of the transects surveyed (Appendix B).

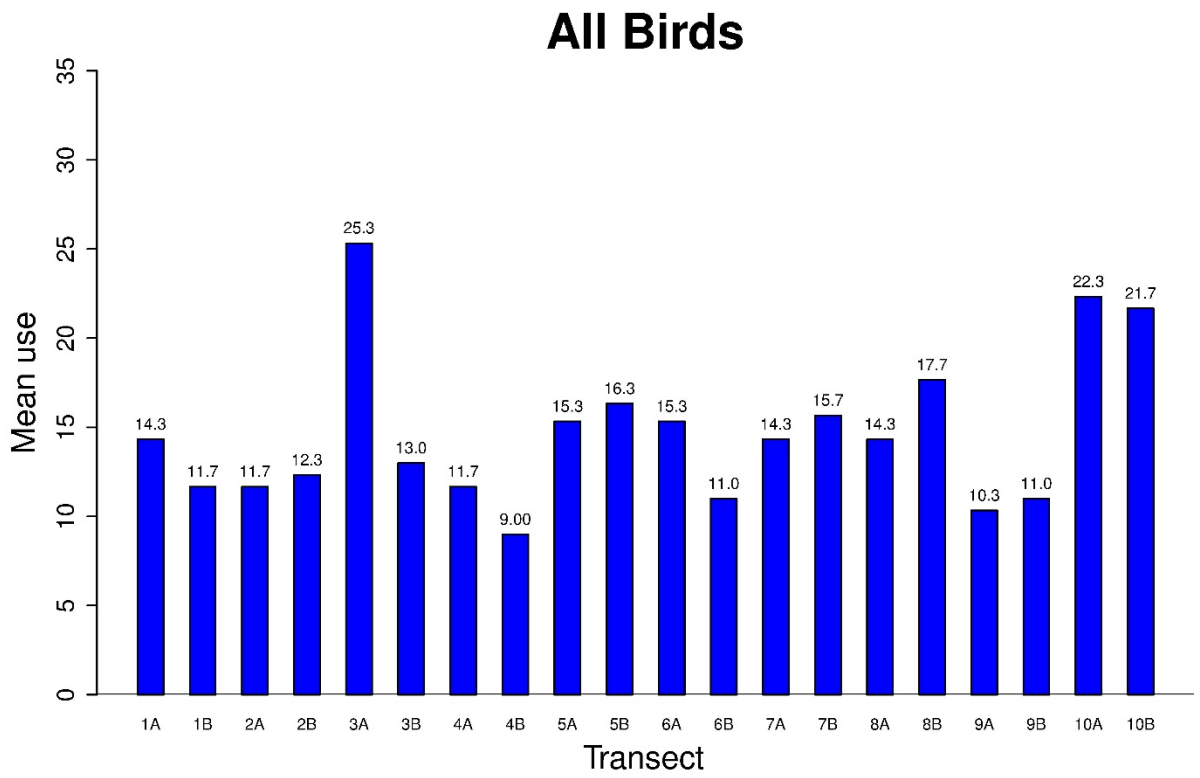

Figure 3. Mean bird use (number of birds/transect/survey) by transect for all birds observed during breeding bird surveys conducted at the Emmons-Logan Wind Energy Center and 230 kV Transmission Line in Emmons and Logan counties, North Dakota, from June 7 – July 8, 2017.

Sensitive Species Observations

No federally endangered or threatened species were observed during breeding bird surveys. Eleven bird species designated as North Dakota SCP, including six bird species identified as SHFC, were observed during surveys. There were eight LI and three LII SCP observed in 368 groups totaling 394 individual observations (Table 4). Chestnut-collared longspur (LI, SHFC) made up over half of the LI and LII SCP observations with 233 individual observations, followed by western meadowlark (LII), with 97 individual observations (Table 4). The Sprague's pipit, also designated as a LI SCP and SHFC, was observed during surveys (Table 4). This species was observed in Transect 10A, located in a 2,166.6-ac (876.8-ha) grassland patch, and transects 2A and 2B, located in a 2,615.03-ac (1,058.3-ha) grassland patch.

Table 4. Summary of sensitive species observed during breeding bird use surveys conducted at the Emmons-Logan Wind Energy Center and 230 kV Transmission Line in Emmons and Logan Counties, North Dakota, from June 7 – July 8, 2017.

Species	Scientific Name	Status[1]	# Groups	# Observations
bobolink[a]	*Dolichonyx oryzivorus*	LII	25	25
chestnut-collared longspur[a]	*Calcarius ornatus*	LI	212	233
grasshopper sparrow[a]	*Ammodramus savannarum*	LI	6	6
lark bunting	*Calamospiza melanocorys*	LI	10	14
marbled godwit	*Limosa fedoa*	LI	1	1
sharp-tailed grouse[a]	*Tympanuchus phasianellus*	LII	3	4
Sprague's pipit[a]	*Anthus spragueii*	LI	4	4
Swainson's hawk	*Buteo swainsoni*	LI	1	1
upland sandpiper[a]	*Bartramia longicauda*	LI	8	8
willet	*Tringa semipalmata*	LI	1	1
western meadowlark	*Sturnella neglecta*	LII	97	97
Total	**11 species**		**368**	**394**

[1] LI and LII = Level I and Level II North Dakota Species of Conservation Priority (Dyke et al. 2015
[a] Species of Habitat Fragmentation Concern (USFWS 2013)

DISCUSSION

To the extent possible, transects were placed within grasslands to determine the occurrence of grassland-dependent bird species of concern within the Project area. Open water and wetlands represent less than 0.1% of the Project area, and use by waterfowl and shorebird species composed a small percentage of the overall bird use observed. Few diurnal raptors, representing two *Buteo* species, were observed during breeding bird surveys; no eagles were document during surveys. Grassland/herbaceous cover and cultivated crops were predominant throughout the Project area and the results of these breeding bird surveys were typical of grassland/agricultural settings in the Midwest (US Department of Agriculture 1999), indicating a high use by passerines, mainly by grassland bird species. Frequently recorded species included the bobolink (*Dolichonyx oryzivorus*), chestnut-collared longspur, Savannah sparrow, and western meadowlark, which are common grassland species in North Dakota (Dyke et al. 2015).

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Appendix A. Mean bird use, percent of use, and frequency of occurrence for each bird type, subtype, and species observed during the breeding bird surveys conducted at the Emmons-Logan Wind Energy Center and 230 kV Transmission Line in Emmons and Logan Counties, North Dakota, from June 7 to July 8, 2017.

Appendix A. Mean bird use (number of birds/transect/survey), percent of use (%), and frequency of occurrence (%) for each bird type, subtype, and species observed during breeding bird surveys conducted at the Emmons-Logan Wind Energy Center and 230 kV Transmission Line in Emmons and Logan Counties, North Dakota, from June 7 – July 8, 2017.

Bird Type/Species	Mean Use	% of Use	% Frequency
Waterfowl	**0.37**	**2.5**	**5.0**
Canada goose	0.33	2.3	3.3
mallard	0.03	0.2	1.7
Shorebirds	**0.28**	**1.9**	**21.7**
killdeer	0.07	0.5	6.7
marbled godwit	0.02	0.1	1.7
upland sandpiper	0.13	0.9	11.7
willet	0.02	0.1	1.7
Wilson's snipe	0.05	0.3	3.3
Diurnal Raptors	**0.08**	**0.6**	**8.3**
Buteos	*0.08*	*0.6*	*8.3*
red-tailed hawk	0.07	0.5	6.7
Swainson's hawk	0.02	0.1	1.7
Upland Game Birds	**0.17**	**1.1**	**15.0**
ring-necked pheasant	0.10	0.7	10.0
sharp-tailed grouse	0.07	0.5	5.0
Doves/Pigeons	**0.15**	**1.0**	**10.0**
mourning dove	0.15	1.0	10.0
Passerines	**13.65**	**92.8**	**100**
Blackbirds/Orioles	*2.68*	*18.2*	*83.3*
bobolink	0.42	2.8	21.7
brown-headed cowbird	0.37	2.5	25.0
common grackle	0.20	1.4	11.7
red-winged blackbird	0.08	0.6	6.7
western meadowlark	1.62	11	75.0
Flycatchers	*0.22*	*1.5*	*13.3*
eastern kingbird	0.13	0.9	8.3
western kingbird	0.08	0.6	6.7
Grassland/Sparrows	*10.73*	*72.9*	*100*
chestnut-collared longspur	3.88	26.4	91.7
clay-colored sparrow	0.10	0.7	6.7
grasshopper sparrow	0.10	0.7	6.7
horned lark	0.05	0.3	3.3
house sparrow	0.02	0.1	1.7
lark bunting	0.23	1.6	8.3
Savannah sparrow	5.90	40.1	100
Sprague's pipit	0.07	0.5	5.0
unidentified sparrow	0.33	2.3	25.0
vesper sparrow	0.05	0.3	5.0
Swallows	*0.02*	*0.1*	*1.7*
barn swallow	0.02	0.1	1.7
Woodpeckers	**0.02**	**0.1**	**1.7**
northern flicker	0.02	0.1	1.7
Overall	**14.72**	**100**	

[a] 328-foot (ft; 100-meter [m]) viewshed (164-ft [50-m] on either side of transect)

Appendix B. Mean bird use by transect for all birds, major bird types, and passerine subtypes observed during breeding bird surveys conducted at the Emmons-Logan Wind Energy Center and 230 kV Transmission Line in Emmons and Logan Counties, North Dakota, from June 7 to July 8, 2017.

Appendix B. Mean bird use (number of birds/transect[a]/survey) by transect for all birds, major bird types, and passerine subtypes observed during breeding bird surveys conducted at the Emmons-Logan Wind Energy Center and 230 kV Transmission Line in Emmons and Logan Counties, North Dakota, from June 7 – July 8, 2017.

	Transect									
Bird Type/Subtype	**1A**	**1B**	**2A**	**2B**	**3A**	**3B**	**4A**	**4B**	**5A**	**5B**
Waterfowl	0.67	0	0	0	6.00	0	0	0	0.67	0
Shorebirds	0	0.33	0	0.67	0.67	0.33	0	0	0.33	0
Diurnal Raptors	0	0	0.33	0	0	0	0	0	0	0
Upland Game Birds	0.33	0	0	0	0	0.33	0	0	0	0.67
Doves/Pigeons	0	0	0	0	0.67	0	0	0.33	0	0
Passerines	13.33	11.33	11.33	11.67	17.67	12.33	11.67	8.67	14.33	15.67
Blackbirds/Orioles	*1.33*	*1.67*	*1.33*	*3.33*	*3.33*	*2.00*	*1.67*	*1.00*	*2.33*	*2.33*
Flycatchers	*0*	*0*	*0*	*1.00*	*0*	*0*	*0.33*	*0*	*0*	*0*
Grassland/Sparrows	*12.00*	*9.67*	*10.00*	*7.33*	*14.33*	*10.33*	*9.67*	*7.67*	*12.00*	*13.33*
Swallows	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Woodpeckers	0	0	0	0	0.33	0	0	0	0	0
Overall	**14.33**	**11.67**	**11.67**	**12.33**	**25.33**	**13.00**	**11.67**	**9.00**	**15.33**	**16.33**

[a] 328-foot (ft; 100-meter [m]) viewshed (164-ft [50-m] on either side of transect)

Appendix B (*continued*). Mean bird use (number of birds/transect[a]/survey) by transect for all birds, major bird types, and passerine subtypes observed during breeding bird surveys conducted at the Emmons-Logan Wind Energy Center and 230 kV Transmission Line in Emmons and Logan Counties, North Dakota, from June 7 – July 8, 2017.

	Transect									
Bird Type/Subtype	**6A**	**6B**	**7A**	**7B**	**8A**	**8B**	**9A**	**9B**	**10A**	**10B**
Waterfowl	0	0	0	0	0	0	0	0	0	0
Shorebirds	0.33	0	1.00	0.67	0	0.33	0	0	0.33	0.67
Diurnal Raptors	0	0	0	0.33	0.33	0	0.33	0	0.33	0
Upland Game Birds	0.67	0	0	0	0	0	0	0.33	0.33	0.67
Doves/Pigeons	0	0	0.33	0.67	0	0	0	0.33	0	0.67
Passerines	14.33	11.00	13.00	14.00	14.00	17.33	10.00	10.33	21.33	19.67
Blackbirds/Orioles	*5.00*	*3.00*	*4.00*	*5.33*	*2.67*	*2.33*	*3.67*	*2.67*	*1.67*	*3.00*
Flycatchers	*0*	*0*	*0.33*	*0*	*0*	*1.67*	*0*	*1.00*	*0*	*0*
Grassland/Sparrows	*9.33*	*8.00*	*8.33*	*8.67*	*11.33*	*13.33*	*6.33*	*6.67*	*19.67*	*16.67*
Swallows	*0*	*0*	*0.33*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Woodpeckers	0	0	0	0	0	0	0	0	0	0
Overall	**15.33**	**11.00**	**14.33**	**15.67**	**14.33**	**17.67**	**10.33**	**11.00**	**22.33**	**21.67**

[a] 328-foot (ft; 100-meter [m]) viewshed (164-ft [50-m] on either side of transect)