



Breeding Bird Assessment

for the

**BURKE COUNTY WIND PROJECT
Burke County, North Dakota**

Prepared for

**Burke Wind, LLC
700 Universe Boulevard
Juno Beach, FL 33408**

Submitted by Atwell, LLC – Atwell Project No. 16000947

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EXECUTIVE SUMMARY

This report summarizes the results of breeding bird surveys conducted for the proposed Burke County Wind Project (the Project) in Burke County, North Dakota. The surveys were performed between June 22 and July 5, 2017, by Atwell, LLC on behalf of Burke Wind, LLC, a wholly owned, indirect subsidiary of NextEra Energy Resources, LLC. All surveys took place within the Avian Use Study Area, defined as the original 300-megawatt (MW) wind turbine configuration plus a 1-mile (1.6 km) boundary area. In late 2018, the Project was reduced in size to 200 MW, and all subsequent references to the Project refer to this 200 MW configuration. Results of the breeding bird surveys are presented in this report for both the Avian Use Study Area and the 200 MW Project configuration.

In addition to avian use point count surveys completed during the spring and fall migration seasons, the breeding bird surveys were completed at the request of the U.S. Fish and Wildlife Service, to characterize avian use across a greater portion of the Project during the breeding season. The surveys not only documented the frequency of occurrence, species richness, and relative abundance of grassland and wetland-associated avian species across the Project and Avian Use Study Area, but the results can be used to inform infrastructure siting considerations.

While the surveys included species of concern, the focus of this effort was to document all avian use of these habitats. The results could then be compared with the proposed turbine array(s) to determine areas of overlap, with the goal of avoiding potential impacts to avian species and assist with project planning.

Key Results

- A total of 104 bird species were detected during the breeding bird surveys. Ninety-seven of these species were detected at points within the Project, and 101 were detected outside the Project but within the Avian Use Study Area.
- No federally listed threatened or endangered species were observed during the breeding season survey. Twenty-one North Dakota Species of Conservation Priority were detected, including 18 observed within the Project area.
- Survey locations with the highest observed species richness and relative abundance for grassland-related avian species tended to be distributed in the eastern half of the Avian Use Study Area, east of the Project.
- Relative abundance and proportion or frequency of occurrence was lower at points within the Project than at points outside the Project for several grassland-associated bird species, including the Bobolink, Grasshopper Sparrow, Sprague's Pipit, Upland Sandpiper, and Western Meadowlark.

- Survey locations with the highest observed species richness and relative abundance for wetland-related avian species (including waterfowl) were distributed throughout the Avian Use Study Area, suggesting that the highest wetland avian use was correlated to local characteristics of individual pothole wetlands or groups of wetlands, rather than the larger-scale landscape trends seen with grassland-associated bird species.
- Relative abundance and proportion of occurrence of the Black Tern and Franklin’s Gull was lower at points within the Project than at points outside the Project. One Black Tern nesting colony was found within the Avian Use Study Area but outside the Project. Franklin’s Gull nesting activity was not observed during the breeding bird surveys in the Avian Use Study Area.

1.0 INTRODUCTION

Atwell, LLC (Atwell) was contracted in 2017 by Burke Wind, LLC, a wholly owned, indirect subsidiary of NextEra Energy Resources, LLC, to conduct breeding bird assessments for the proposed Burke County Wind Project (the Project) in Burke County, North Dakota. All surveys were conducted within the Avian Use Study Area, defined as the original 300 megawatt (MW) wind turbine project area plus an additional 1-mile (1.6 km) boundary. In late 2018, the Project was reduced in size to 200 MW, and all subsequent references to the Project refer to this 200 MW configuration. This resulted in a smaller Project area (approximately 22,933 acres [9,281 hectares]) and the elimination of 38 wind turbines. In Figure 1 (**Appendix I**), the Avian Use Study Area is shown with a dashed line and the 200 MW Project is delineated with a solid black line.

The objective of the surveys summarized in this report was to document avian use during the breeding season within the Avian Use Study Area, with a specific focus on characterizing species composition, relative abundance, and species richness of grassland and wetland-associated bird species. Emphasis was placed on accessing as much of the Avian Use Study Area as possible from roadside survey vantages adjacent to grassland and wetland habitats, with the purpose of increasing survey coverage beyond areas assessed by ongoing avian use point count surveys.

2.0 METHODS

Based on discussions with Mr. Kevin Shelly of the U.S. Fish and Wildlife Service in early 2017, breeding season avian use surveys were conducted for the proposed Project—in addition to the spring and fall avian use studies—to specifically document avian species' composition and use of grassland and wetland habitats during the breeding season across the Avian Use Study Area. For the purposes of this report, species of concern include those defined as such under the *U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines* (WEG) (USFWS 2012) and species identified by the state of North Dakota as Species of Conservation Priority (SCP). The WEG define species of concern as any species that (a) is listed as endangered, threatened, or as a candidate species under the Endangered Species Act, subject to the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act; designated by law, regulation, or other formal process for protection and/or management by the relevant agency or other authority; or has been shown to be significantly adversely affected by wind energy development, and (b) is determined to be possibly affected by a project (USFWS 2012). SCP are designated in the 2015 North Dakota State Wildlife Action Plan produced by the North Dakota Game and Fish Department (Dyke et al. 2015).

The studies summarized in this report are consistent with recommendations for Tier 3 studies under the WEG. Under Tier 3, field studies are conducted to develop a better understanding of avian use of a site. For this Project, Tier 3 breeding assessment studies were conducted within areas identified as potentially suitable nesting and foraging habitat for wetland-associated (including waterfowl) and grassland-associated bird species, including species of concern. Specifically, surveys were designed to summarize species composition across the Avian Use Study Area and identify areas that had higher proportions or frequencies of species occurrence, richness, and relative abundance. The results of these surveys could then be compared with the proposed turbine arrays to determine areas of overlap with high avian use, informing the formulations of measures to avoid potential impacts to avian species.

This report adheres to taxonomy outlined in the American Ornithological Society's online *Checklist of North and Middle American Birds*, 59th supplement (Chesser et al. 2018).

2.1 Project Setting

The Project is situated on approximately 22,933 acres (9,281 hectares) in Burke County, northwest North Dakota (Figure 1, **Appendix I**). The Project land area is predominantly agricultural cropland and grassland within a regional prairie pothole wetland system. The general topography of the Project slopes along a ridgeline that is oriented southeast-northwest. Elevations within the Project range from approximately 2,159 to 2,502 ft (658 to 762 m) above mean sea level.

According to the 2011 National Land Cover Database – Land Use Land Cover data set, approximately 54.1% of the Project land area is grassland-type habitat (approximately 12,400 acres [5,018

hectares] of herbaceous and hay/pasture land cover types), and 32.0% is classified as cultivated crops (7,346 acres [2,973 hectares]) (Homer et al. 2015). Additional cover classifications found within the Project include open water (4.7%), emergent herbaceous wetlands (4.1%), aggregated development classifications (3.4%), deciduous forest (1.5%), and woody wetlands (0.2%).

2.2 Road-Based Breeding Bird Assessments

Road-based breeding bird assessments followed a fixed-point protocol to document species composition across the Avian Use Study Area, a protocol that followed guidelines in the United States Geologic Survey's *North American Breeding Bird Survey* (USGS 2001) and the regionally specific Saskatchewan Ministry of Environment's *Grassland Birds Survey Protocol* (Saskatchewan Ministry of Environment 2014).

The study plan established 115 survey points adjacent to grassland/pasture and/or wetland habitats in the Avian Use Study Area (Figure 1, **Appendix I**). Fifty-four of the 115 survey points are within the current Project configuration. Eighty-eight survey points are within 328 ft (100 m) of a pothole wetland. Point count stations were located along roads with low traffic levels, with reasonable survey vantages of the surrounding landscape. Because land acquisition was in the early stages at the time of study plan development, point count stations were restricted to roadside locations. Point count stations were selected at half-mile (805 m) intervals across the Avian Use Study Area, along public roads at locations bordered by grassland/pasture and/or wetland habitat. If such habitats were not found at a half-mile segment location (e.g., the road was instead bordered by tilled agriculture), the surveyor continued to the next closest location where grassland/pasture or wetland was present and resumed surveys at that location. Survey locations were occasionally less than a half-mile apart to accommodate for limited sight lines caused by rolling terrain, or for the presence of habitat that appeared of relatively higher quality and that merited further survey effort.

Surveys were conducted during the breeding season, from June 22 to June 26 and July 1 to July 5, 2017. Surveyors recorded counts for all bird species heard or seen over a five-minute survey duration at each station. Any breeding behaviors observed were also recorded, e.g., singing, nesting material carry, and food carry to dependent young.

2.3 Data Management

The survey protocols described above were performed by two avian biologists over the course of the study. All completed data forms were proofread, with data subsequently entered into an electronic database and proofread as part of a quality assurance/quality control program.

2.4 Data Analysis

Survey data were organized and analyzed using Microsoft Excel. The following metrics were then calculated and are summarized in this report:

- *Species richness* is reported as the total number of species observed, averaged per visit, for each of the 115 survey locations.
- *Proportion of occurrence* is reported as the number of survey locations at which the species was recorded divided by the total number of survey locations.
- *Relative abundance* is reported as the total number of individuals observed for each species within a 500 m radius of the point, averaged per visit, for each of the 115 survey locations assessed during the study.

Species richness and relative abundance are summarized for groups of species associated with grassland or wetland habitats to facilitate data analysis and presentation of results. The grassland group includes passerines (perching birds such as songbirds) as well as grouse and specific raptor and shorebird species associated with grassland habitats. Birds associated with wetland habitats were grouped into waterfowl and waterbird subgroups. The waterbird subgroup includes waders such as herons and bitterns; birds of the Rallidae family, such as coots and rails; birds of the Laridae family, such as gulls and terns, grebes, pelicans, and cormorants.

3.0 RESULTS AND DISCUSSION

3.1 Federally Listed Threatened and Endangered Species

Atwell biologists did not observe any federally endangered or federally threatened bird species during the breeding bird assessments.

3.2 Grassland-Associated Bird Species

3.2.1 Species Richness and Relative Abundance

Survey locations with the highest grassland-associated avian species richness and abundance values tended to be in the eastern half of the Avian Use Study Area and outside the Project, suggesting that higher quality grassland habitats are more widespread in that area. Twenty-six of 61 survey points (42.6%) outside the Project reported grassland species richness of at least six species/visit. Fifteen of 54 points (27.8%) within the Project reported grassland species richness of at least six species per visit. Conversely, 11 of 61 (18.0%) survey points outside the Project reported a species richness of three or fewer species per visit, and 23 of 54 (42.6%) survey points within the Project reported a species richness of three or fewer species per visit.

Grassland-associated species richness ranged from one to eight species per visit at points within the Project and one to nine species per visit at points outside the Project but within the Avian Use Study Area (Figure 2, **Appendix I; Appendix II**). Relative abundance for grassland-associated species ranged from 4 to 88 individuals/visit at points within the Project and from 5 to 91 individuals/visit at points outside the Project (Figure 3, **Appendix I; Appendix II**).

3.2.2 Grassland Species of Conservation Priority

Five grassland Level I SCP were observed during the breeding bird surveys, including the Grasshopper Sparrow (*Ammodramus savannarum*), Marbled Godwit (*Limosa fedoa*), Nelson's Sparrow (*Ammodramus nelsoni*), Sprague's Pipit (*Anthus spragueii*), and Swainson's Hawk (*Buteo swainsoni*). Six grassland Level II SCP species were observed during the assessments, including the Bobolink (*Dolichonyx oryzivorus*), Northern Harrier (*Circus hudsonius*), Sharp-tailed Grouse (*Tympanuchus phasianellus*), Upland Sandpiper (*Bartramia longicauda*), Western Meadowlark (*Sturnella neglecta*), and Willet (*Tringa semipalmata*). The following sections discuss general patterns observed for grassland-associated SCP species observed during the breeding bird surveys.

Bobolink

Bobolinks were detected at a lower proportion of points within the Project (29.6%) than outside the Project (49.2%). Average counts were lower within the Project (0.76 individuals/visit, standard deviation [SD] = 1.74) than outside the Project (0.94 individuals/visit, SD = 1.46).

Grasshopper Sparrow

Twenty-three Grasshopper Sparrows were detected at seven locations during the breeding bird surveys. Only one of these locations (point 46, with three detections) is within the Project. Twenty detections occurred outside the Project.

Marbled Godwit

Nine Marbled Godwits were detected at four locations during the breeding bird surveys. Three godwits were detected at two points within the Project, and six were detected at two points outside the Project.

Nelsons Sparrow

Three Nelson's Sparrows were detected at two locations during the study: one pair was observed at point 61, and a singing male was observed at point 32. Point 61 is approximately 3.8 miles (6.1 km) southeast of the Project; point 32 is within the Project.

Northern Harrier

Northern Harriers were detected at a similar proportion of points within the Project (7.4%) and outside the Project (6.6%). Average counts were also similar at points within the Project (0.07 individuals/visit, SD = 0.26) and outside the Project (0.04 individuals/visit, SD = 0.20).

Sharp-Tailed Grouse

Five Sharp-tailed Grouse were observed at five locations during the breeding bird surveys. Three of these locations were within the Project.

Sprague's Pipit

Four Sprague's Pipits were observed at one location over two visits during the study, at point 90. Multiple displaying males were observed during the second visit to this point. This location is in the eastern portion of the Avian Use Study Area and is approximately 9.0 miles (14.5 km) east of the Project.

Swainson's Hawk

Four Swainson's Hawks were detected at four locations during the study. Two of these detections represent a single individual observed at adjacent points. All four points are located outside the Project, and Swainson's Hawks were not observed within the Project during the breeding bird surveys.

Upland Sandpiper

Upland Sandpipers were detected at a lower proportion of points within the Project (16.7%) than at points outside the Project (39.3%). Average counts were also lower within the Project (0.25 individuals/visit, SD = 0.89) than outside the Project (0.56 individuals/visit, SD = 1.07).

Western Meadowlark

Western Meadowlarks were detected at a lower proportion of points within the Project (31.5%) than outside the Project (47.5%). Average counts were lower within the Project (0.42 individuals/visit, SD = 0.86) than outside the Project (1.22 individuals/visit; SD = 1.58).

Willet

Willetts were detected at a higher proportion of points within the Project (16.7%) than outside the Project (11.5%). Average counts per visit were also higher within the Project (Project: 0.25 individuals/visit, SD = 0.75; outside the Project: 0.10 individuals/visit, SD = 0.39).

3.3 Waterfowl and Other Wetland-Associated Bird Species

3.3.1 Species Richness and Relative Abundance

Pothole wetlands occur throughout the Avian Use Study Area (Figure 1, **Appendix I**). Waterfowl and other wetland-associated species' richness and abundance are influenced by landscape-level features of the pothole wetland system (Niemuth and Solberg 2003) and by characteristics of individual pothole wetlands, which can influence wet grassland habitat important for nesting of many bird species (Fairbairn and Dinsmore 2001). Furthermore, upland grasslands adjacent to pothole wetlands provide important nesting habitat for ducks (Reynolds et al. 2001).

Species richness and relative abundance are depicted for waterfowl species and for all wetland-associated species, including waterfowl, wading birds, shorebirds, gulls and terns, rallids, grebes, and cormorants. (See Section 2.4 for descriptions of these species groups, and Figures 4 through 7 [**Appendix I**]). Wetland points with the highest richness and abundance values were distributed throughout the Avian Use Study Area, suggesting that highest wetland avian use corresponded with local conditions specific to the wetland or group of wetlands rather than larger landscape-scale trends across the Avian Use Study Area.

Waterfowl species richness ranged from 0 to 11 species per visit for points both within the Project and for points outside the Project but within the Avian Use Study Area (Figure 4, **Appendix I; Appendix II**). Relative abundance for waterfowl species ranged from 0 to 254 individuals/visit within the Project and from 0 to 119 individuals/visit at points outside of the Project (Figure 5, **Appendix I; Appendix II**). Figures 4 and 5 depict waterfowl richness and relative abundance for survey points across the Avian Use Study Area.

Wetland species richness ranged from 0 to 24 species for points within the Project and from 0 to 15 species for points outside the Project (Figure 6, **Appendix I; Appendix II**). Relative abundance for all wetland species ranged from 0 to 433 individuals/visit at points within the Project and from 0 to 237 individuals/visit at points outside the Project (Figure 7, **Appendix I; Appendix II**). In general,

several of the points with the highest richness and abundance values were in the eastern half of the Avian Use Study Area and southeast of the Project.

3.3.2 Wetland Species of Conservation Priority

Five wetland-associated Level I SCP were observed during the breeding bird surveys, including the American Bittern (*Botaurus lentiginosus*), Black Tern (*Chlidonias niger*), Franklin's Gull (*Leucophaeus pipixcan*), Horned Grebe (*Podiceps auritus*), and Wilson's Phalarope (*Phalaropus tricolor*). Five wetland-associated Level II SCP were observed during the assessments, including the American Avocet (*Recurvirostra americana*), American White Pelican (*Pelecanus erythrorhynchos*), Canvasback (*Aythya valisineria*), Lesser Scaup (*Aythya affinis*), and Northern Pintail (*Anas acuta*). The following sections discuss general patterns observed for wetland-associated SCP species observed during the breeding bird surveys.

American Avocet

Fifteen American Avocets were observed at five locations during the breeding bird surveys. Flock sizes ranged from one to seven individuals. One individual was detected at point 109, more than 1 mile (1.6 km) east of the Project. The other 14 individuals were observed within the Project,

American Bittern

One American Bittern was observed during the surveys. This observation occurred at point 112, more than 1.1 miles (1.8 km) east of the Project.

American White Pelican

Six American White Pelicans were observed in groups of two, at three locations (points 7, 68, and 108) during the breeding bird surveys. Two of these individuals were observed within the Project; the other four pelicans were observed within the Avian Use Study Area but more than 5.5 miles (8.9 km) east of the Project.

Black Tern

Black Terns were observed at a lower proportion of points within the Project (20.4%) than within the Avian Use Study Area (49.2%). Mean counts were also lower within the Project (0.56 individuals/visit, SD = 1.69) than within the Avian Use Study Area (2.37 individuals/visit, SD = 4.41). One Black Tern nesting colony was found during the assessments at point 62. At this location, approximately 7.2 miles (11.6 km) southeast of the Project, terns were observed on nests; they were vocal, aggressive, and frequently mobbed (i.e., aggressively approached and/or surrounded) the observer. These behaviors were not observed at any of the other points surveyed during wetland breeding bird assessments, including those within the Project.

Canvasback

Surveyors recorded lower occurrence rates for Canvasbacks within the Project (observed at 7.4% of points) than outside the Project (19.7% of points). Average counts were also lower within the Project (0.23 individuals/visit, SD = 1.06) than outside the Project (0.79 individuals /visit, SD = 2.51).

Franklin's Gull

Franklin's Gulls were observed at the majority of points during roadside surveys (observed at 68.5% of points within the Project and at 83.6% of points outside the Project), but nesting colonies were not observed within the Avian Use Study Area. At point 56, a single individual exhibited agitated behavior over the course of several minutes, which can be suggestive of a nearby nesting attempt. However, this individual did not approach a nest or fledglings during extended observation and it eventually left the point. Point 56 is outside the Project. The closest known Franklin's Gull nesting colony is 4 miles (6.4 km) north of the Avian Use Study Area, near Lignite, North Dakota (48.8610° N, 102.6226° W).

Horned Grebe

Three Horned Grebes were observed during the breeding bird surveys. One individual was observed at point 7 within the Project. A nesting pair was observed on both visits to point 87, approximately 5.4 miles (8.9 km) southeast of the Project.

Lesser Scaup

Lesser Scaup occurrence rates were similar within the Project (observed at 64.8% of points) and outside of the Project (67.2%). Average counts were slightly higher within the Project (Project: 5.80 individuals/visit, SD = 8.94; outside the Project: 4.28 individuals/visit, SD = 6.81).

Northern Pintail

Northern Pintail occurrence rates were higher within the Project (observed at 18.5% of points) than outside the Project (6.6%). Average counts were also higher within the Project (0.52 individuals/visit, SD = 1.58) than outside the Project (0.08 individuals/visit, SD = 0.47).

Wilson's Phalarope

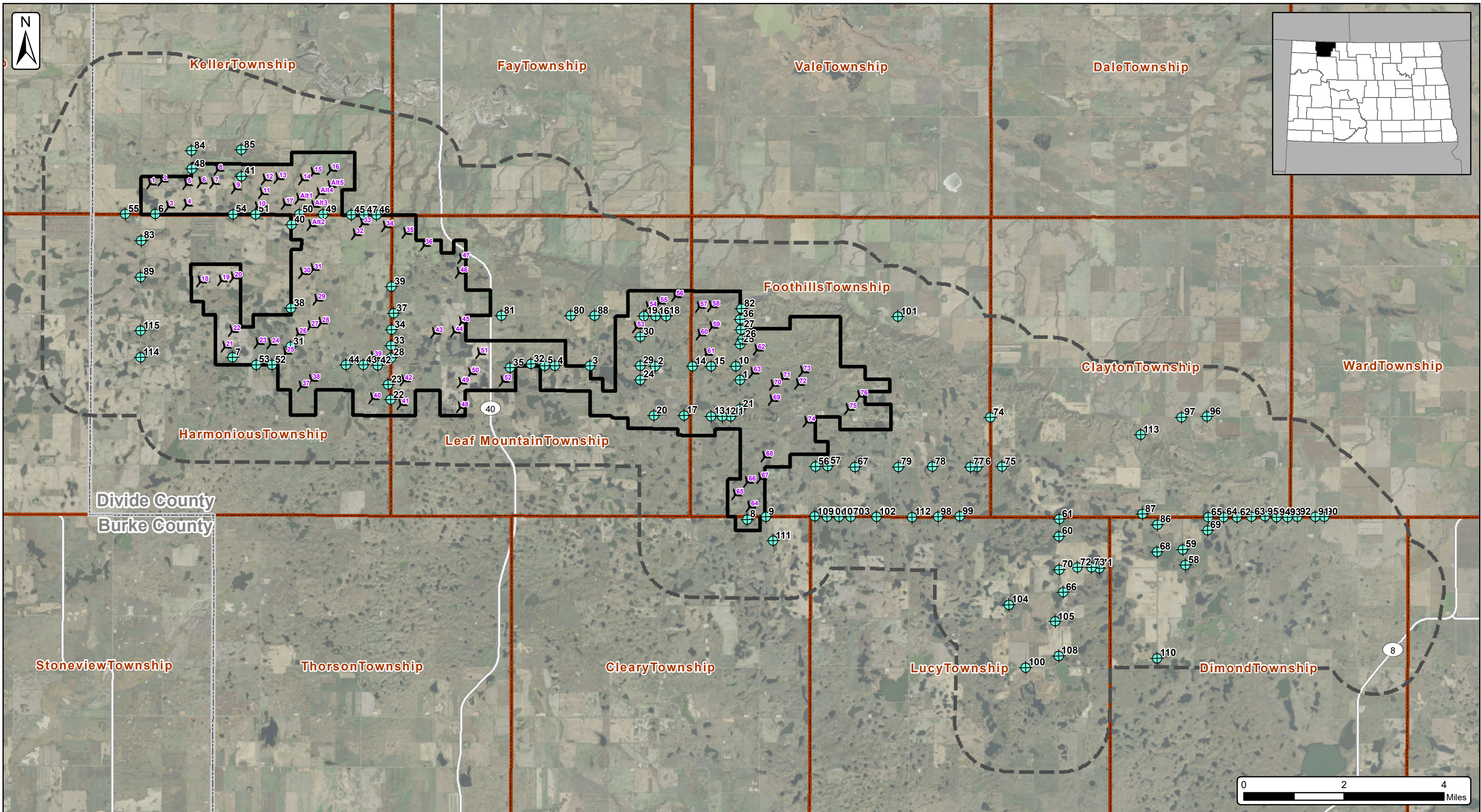
Wilson's Phalaropes were encountered throughout the Avian Use Study Area and were reported at 24.1% of points within the Project and 16.4% of points outside the Project. Average counts per visit were also higher within the Project (mean = 0.41, SD = 1.55) than outside the Project (mean = 0.23, SD = 0.81).

4.0 REFERENCES

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APPENDIX I



Figures



Burke County Wind Project
Figure 1. Breeding Bird Assessment Survey Plan
 Burke County, North Dakota
 Date: 1/18/2019

Client:
Burke Wind, LLC
Atwell, LLC Project:16000947

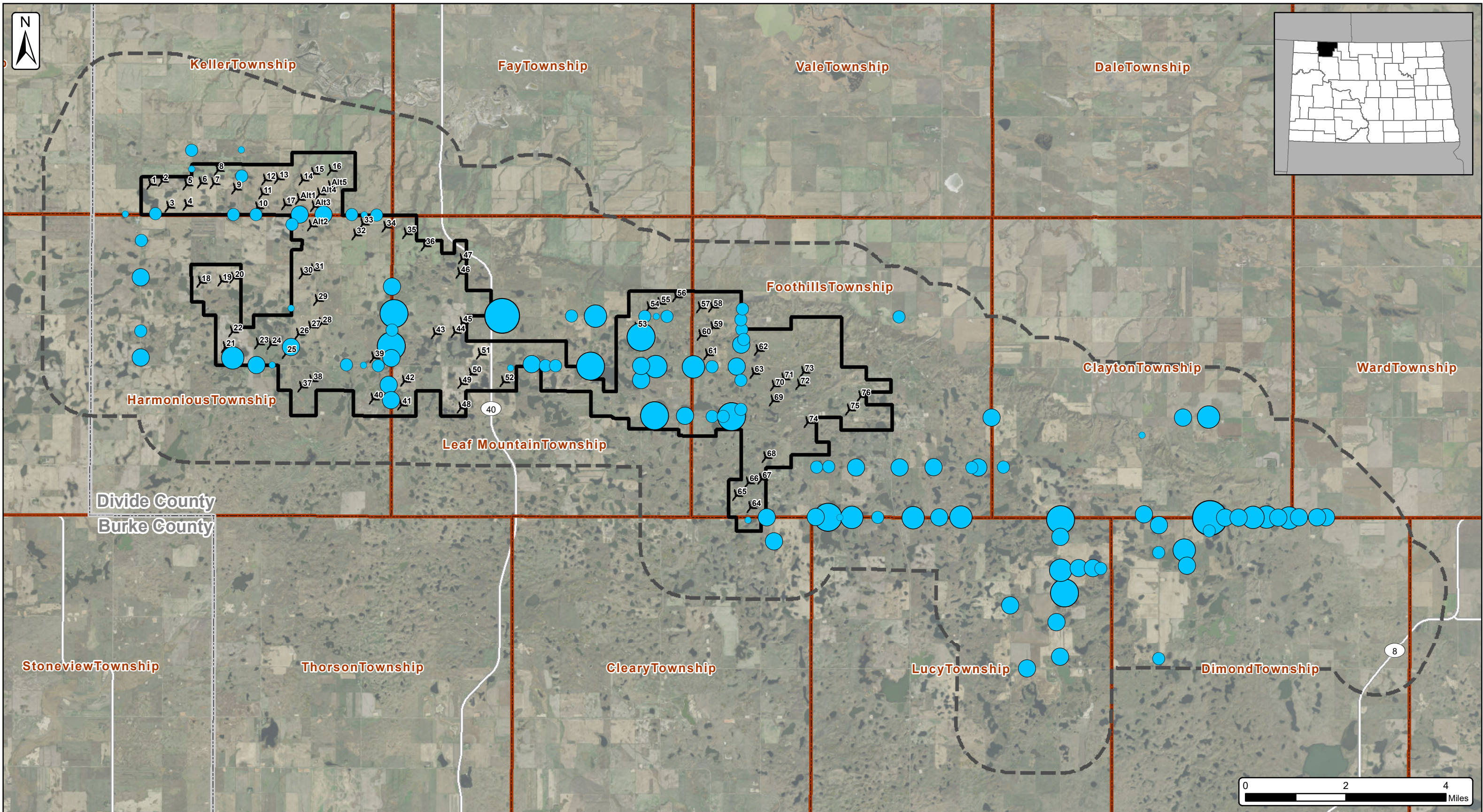
-  Breeding Bird Point Count Station (01/15/2019)
-  Turbine Layout (10/08/2018)
-  Project 10/23/2018 (±22,933 Ac.)
-  Avian Use Study Area (01/25/2017)

-  Townships
-  Counties



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SOURCE: USDA NAIP 2017 IMAGERY



Burke County Wind Project
Figure 2. Grassland Bird Species Richness
 Burke County, North Dakota
 Date: 1/18/2019

Client:
Burke Wind, LLC
Atwell, LLC Project:16000947

Turbine Layout (10/08/2018)
 Project 10/23/2018 (±22,933 Ac.)
 Avian Use Study Area (01/25/2017)
 Townships
 Counties

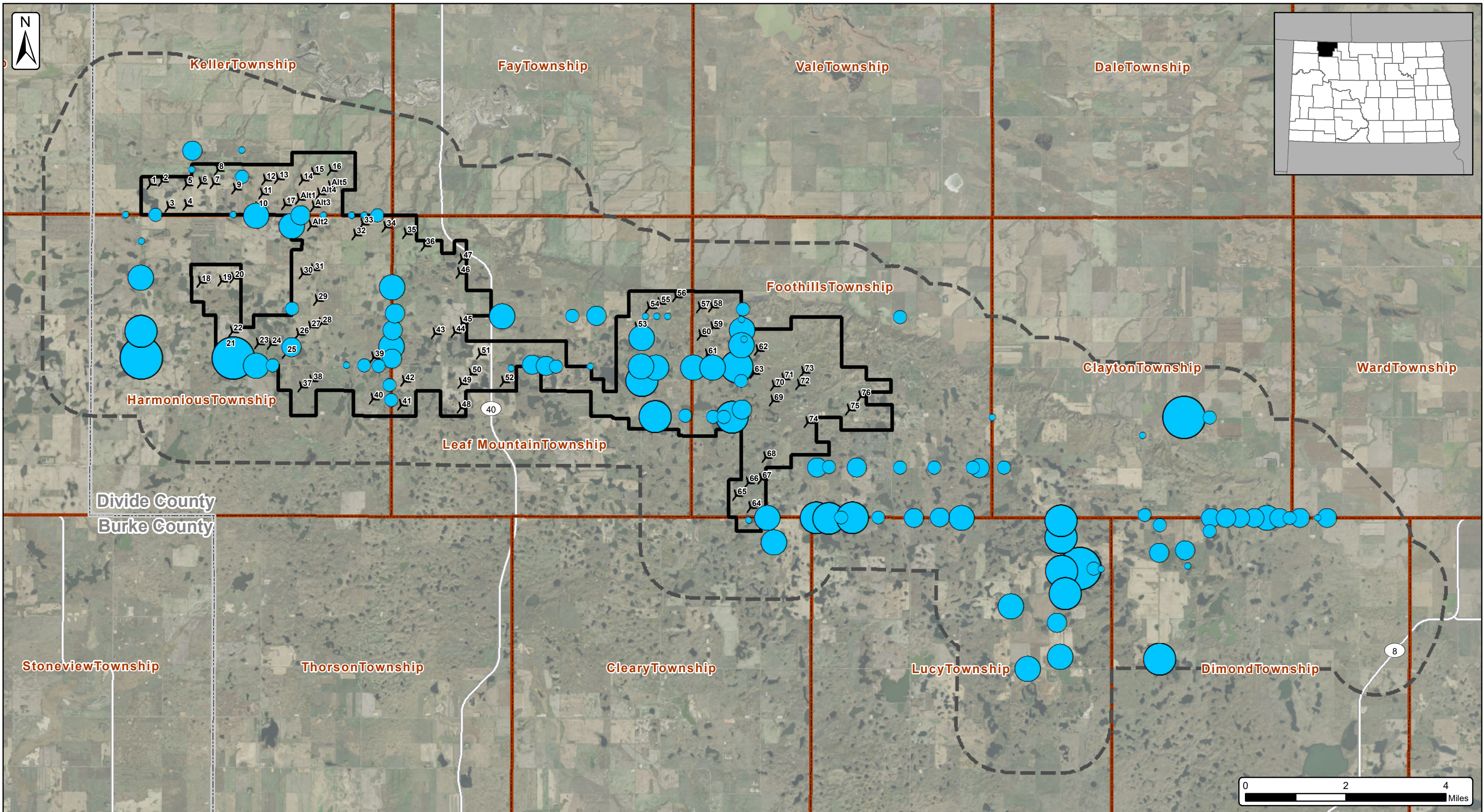
Grassland Bird Species Richness

	8.01 - 9.00
	7.01 - 8.00
	6.01 - 7.00
	4.01 - 6.00
	2.01 - 4.00
	1.00 - 2.00

SOURCE: USDA NAIP 2017 IMAGERY

ATWELL

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Burke County Wind Project
Figure 3. Grassland Bird Species Relative Abundance
 Burke County, North Dakota
 Date: 1/18/2019

Client:
Burke Wind, LLC
Atwell, LLC Project:16000947

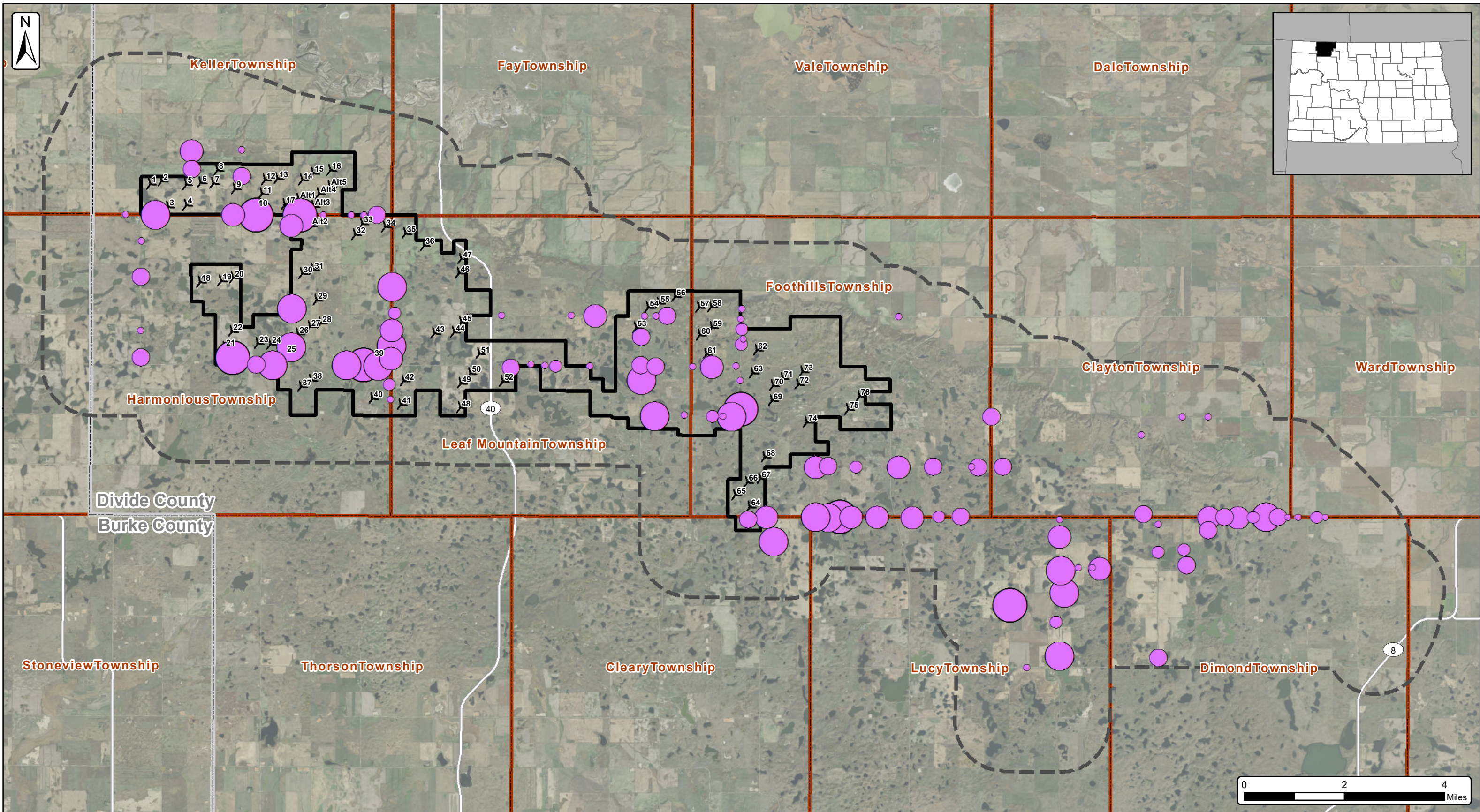
Turbine Layout (10/08/2018)
 Project 10/23/2018 (±22,933 Ac.)
 Avian Use Study Area (01/25/2017)
 Townships
 Counties

Grassland Bird Species Relative Abundance

	60.01 - 91.00
	39.01 - 60.00
	26.01 - 39.00
	18.01 - 26.00
	11.01 - 18.00
	4.00 - 11.00

SOURCE: USDA NAIP 2017 IMAGERY

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Burke County Wind Project
Figure 4. Waterfowl Species Richness
 Burke County, North Dakota
 Date: 1/18/2019

Client:
Burke Wind, LLC
Atwell, LLC Project:16000947

Turbine Layout (10/08/2018)
 Project 10/23/2018 (±22,933 Ac.)
 Avian Use Study Area (01/25/2017)
 Townships
 Counties

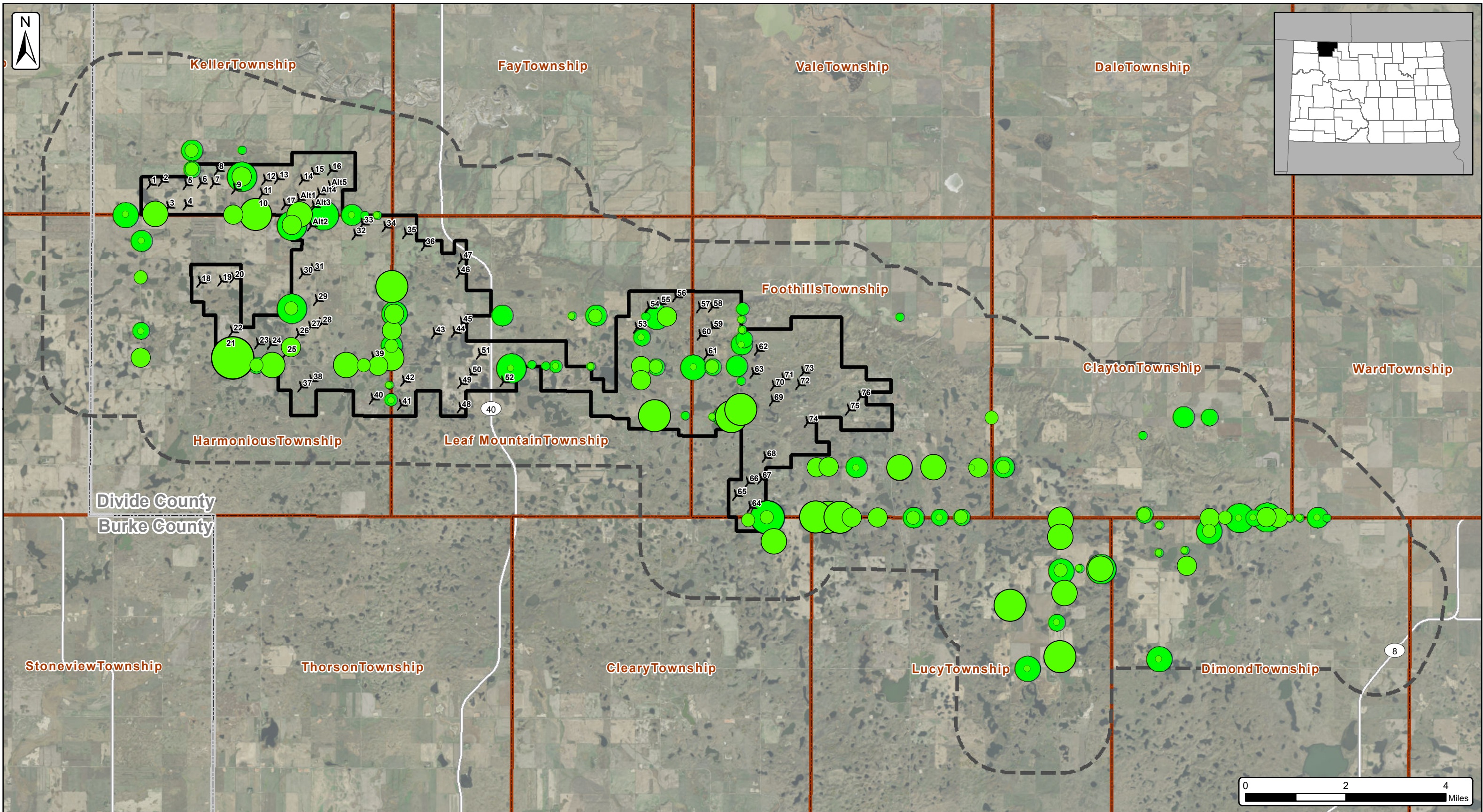
Waterfowl Species Richness

	8.01 - 11.00
	5.51 - 8.00
	4.51 - 5.50
	2.51 - 4.50
	1.01 - 2.50
	0.00 - 1.00

SOURCE: USDA NAIP 2017 IMAGERY


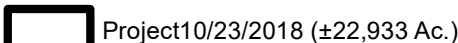
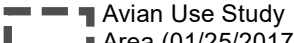


ATWELL

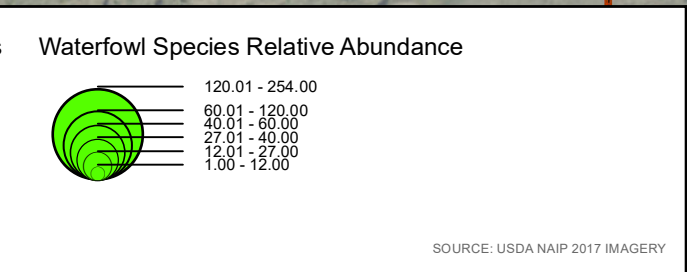

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Burke County Wind Project
Figure 5. Waterfowl Species Relative Abundance
 Burke County, North Dakota
 Date: 1/18/2019

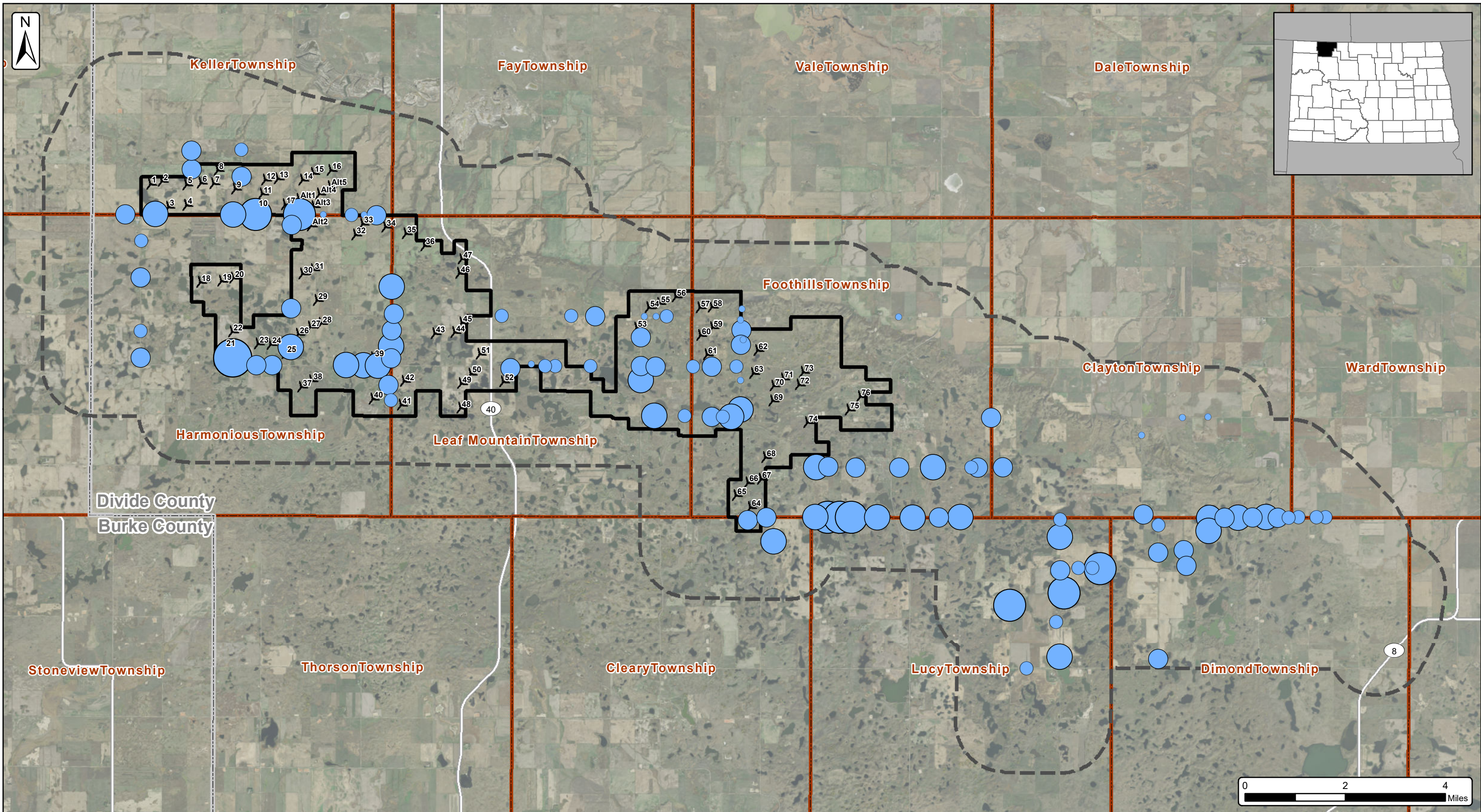
Client:
Burke Wind, LLC
Atwell, LLC Project:16000947

-  Turbine Layout (10/08/2018)
-  Project 10/23/2018 (±22,933 Ac.)
-  Avian Use Study Area (01/25/2017)
-  Townships
-  Counties

The information contained on this map is proprietary and confidential. The use or disclosure of this information by you to third parties is prohibited by law and may give rise to civil or criminal liability.

SOURCE: USDA NAIP 2017 IMAGERY



Burke County Wind Project
Figure 6. All Wetland Bird Species Richness
 Burke County, North Dakota
 Date: 1/18/2019

Client:
Burke Wind, LLC
Atwell, LLC Project:16000947

Turbine Layout (10/08/2018)
 Project 10/23/2018 (±22,933 Ac.)
 Avian Use Study Area (01/25/2017)
 Townships
 Counties

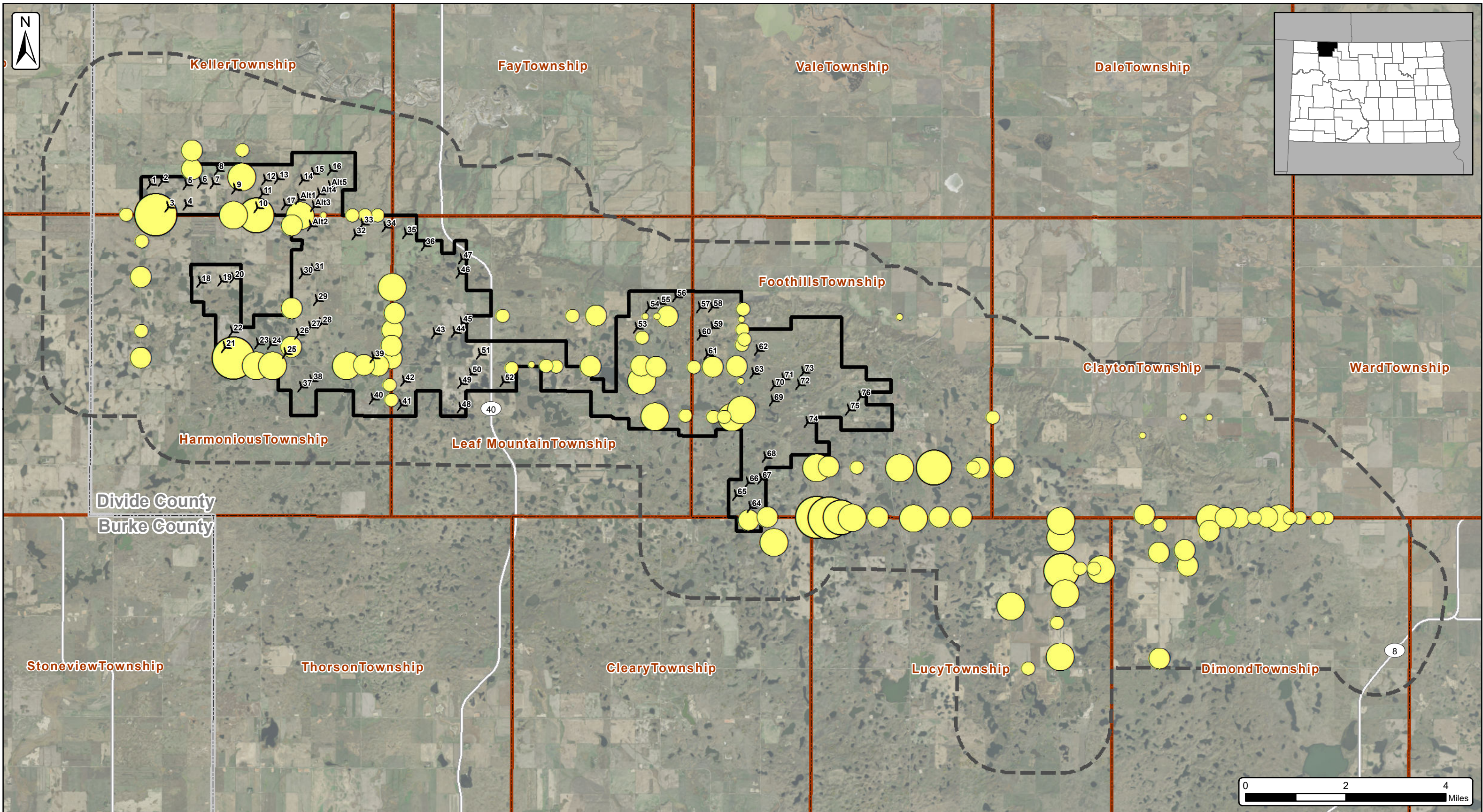
All Wetland Bird Species Richness

	17.01 - 24.00
	12.01 - 17.00
	8.01 - 12.00
	3.01 - 8.00
	1.01 - 3.00
	0.00 - 1.00

SOURCE: USDA NAIP 2017 IMAGERY

ATWELL

The information contained on this map is proprietary and confidential. The use or disclosure of this information by you to third parties is prohibited by law and may give rise to civil or criminal liability.



Burke County Wind Project
Figure 7. All Wetland Bird Species Relative Abundance
 Burke County, North Dakota
 Date: 1/18/2019

Client:
Burke Wind, LLC
Atwell, LLC Project:16000947

Turbine Layout (10/08/2018)
 Project 10/23/2018 (±22,933 Ac.)
 Avian Use Study Area (01/25/2017)
 Townships
 Counties

All Wetland Bird Species Relative Abundance

	159.01 - 433.00
	105.01 - 159.00
	49.01 - 105.00
	20.01 - 49.00
	1.01 - 20.00
	0.00 - 1.00

SOURCE: USDA NAIP 2017 IMAGERY

ATWELL

The information contained on this map is proprietary and confidential. The use or disclosure of this information by you to third parties is prohibited by law and may give rise to civil or criminal liability.

APPENDIX II

Average Species Richness and Relative Abundance for Habitat-Associated Species Groups
within and outside the Burke County Wind Project

Table A. Average Species Richness and Relative Abundance for Habitat-Associated Species Groups within the Burke County Wind Project (Burke County, North Dakota)

Point Count Station	Count Station Field ID	Lat.	Long.	Habitat	No. Visits	Grassland Birds		Waterfowl		Waterbirds		Waterfowl + Waterbirds Combined	
						Species Richness	Relative Abundance	Species Richness	Relative Abundance	Species Richness	Relative Abundance	Species Richness	Relative Abundance
1	101	48.760	-102.656	Gr/We	1	4.00	17.00	0.00	0.00	1.00	1.00	1.00	1.00
2	102	48.764	-102.693	Gr/We	1	7.00	30.00	3.00	21.00	3.00	3.00	6.00	24.00
3	103	48.764	-102.721	Gr/We	1	8.00	11.00	1.00	4.00	2.00	21.00	3.00	25.00
4	105	48.764	-102.737	Gr/We	1	3.00	14.00	2.00	12.00	1.00	1.00	3.00	13.00
5	106	48.764	-102.741	Gr/We	1	4.00	22.00	0.00	0.00	3.00	9.00	3.00	9.00
6	109	48.807	-102.912	Ag/We	2	2.50	13.50	6.00	45.00	3.50	191.50	9.50	236.50
7	111	48.766	-102.878	Ag/We	1	7.00	88.00	11.00	254.00	13.00	179.00	24.00	433.00
8	118	48.720	-102.652	Gr/We	1	2.00	9.00	4.00	20.00	3.00	7.00	7.00	27.00
9	147	48.720	-102.644	Gr/We	2	5.00	39.00	5.50	17.00	1.00	6.50	6.50	23.50
10	150	48.764	-102.658	Gr/We	1	5.00	54.00	0.00	0.00	2.00	28.00	2.00	28.00
11	155	48.749	-102.660	Ag/We	2	7.50	58.50	7.00	91.50	1.50	3.50	8.50	95.00
12	156	48.749	-102.664	Gr/We	1	3.00	14.00	0.00	0.00	2.00	3.00	2.00	3.00
13	157	48.750	-102.668	Gr/We	2	4.00	17.50	1.50	6.00	2.00	4.50	3.50	10.50
14	158	48.764	-102.677	Gr/We	1	7.00	27.00	1.00	2.00	2.00	2.00	3.00	4.00
15	159	48.764	-102.668	Ag/Gr/We	1	3.00	27.00	5.00	24.00	2.00	2.00	7.00	26.00
16	164	48.778	-102.693	Ag/Gr/We	1	2.00	6.00	0.00	0.00	1.00	1.00	1.00	1.00
17	165	48.750	-102.680	Gr/We	2	5.00	17.50	0.00	0.00	2.00	8.00	2.00	8.00
18	166	48.778	-102.688	Ag/Gr/We	1	3.00	9.00	3.00	28.00	0.00	0.00	3.00	28.00
19	168	48.778	-102.698	Gr/We	1	3.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
20	169	48.750	-102.694	Gr/We	2	7.50	42.00	6.00	79.00	3.50	15.00	9.50	94.00
21	181	48.752	-102.656	Ag/We	1	3.00	22.00	9.00	90.00	1.00	1.00	10.00	91.00
22	182	48.754	-102.809	Gr/We	1	5.00	14.00	1.00	5.00	1.00	2.00	2.00	7.00

Table A. Average Species Richness and Relative Abundance for Habitat-Associated Species Groups within the Burke County Wind Project (Burke County, North Dakota)

Point Count Station	Count Station Field ID	Lat.	Long.	Habitat	No. Visits	Grassland Birds		Waterfowl		Waterbirds		Waterfowl + Waterbirds Combined	
						Species Richness	Relative Abundance	Species Richness	Relative Abundance	Species Richness	Relative Abundance	Species Richness	Relative Abundance
23	184	48.758	-102.810	Gr/We	1	6.00	17.00	2.00	4.00	2.00	2.00	4.00	6.00
24	185	48.760	-102.699	Gr/We	1	6.00	43.00	6.00	32.00	4.00	69.00	10.00	101.00
25	187	48.770	-102.656	Gr/We	2	6.00	32.00	1.50	3.00	2.50	3.00	4.00	6.00
26	188	48.772	-102.655	Gr/We	1	3.00	11.00	0.00	0.00	1.00	6.00	1.00	6.00
27	189	48.775	-102.655	Gr/We	1	4.00	36.00	2.00	9.00	3.00	8.00	5.00	17.00
28	191	48.766	-102.809	Gr/We	2	5.00	23.50	5.50	45.50	2.00	3.50	7.50	49.00
29	193	48.764	-102.699	Gr/We	2	4.50	30.00	4.00	33.00	2.50	3.00	6.50	36.00
30	194	48.772	-102.699	Ag/Gr/We	2	7.50	29.00	3.00	9.50	1.50	6.00	4.50	15.50
31	195	48.769	-102.852	Ag/We	1	6.00	22.00	7.00	37.00	2.00	3.00	9.00	40.00
32	198	48.765	-102.747	Gr/We	1	6.00	24.00	0.00	0.00	1.00	1.00	1.00	1.00
33	199	48.770	-102.809	Ag/Gr/We	1	8.00	28.00	6.00	26.00	3.00	4.00	9.00	30.00
34	200	48.774	-102.808	Ag/Gr/We	3	3.33	24.67	5.00	30.67	2.33	3.33	7.33	34.00
35	201	48.763	-102.756	Gr/We	1	2.00	4.00	3.00	7.00	2.00	6.00	5.00	13.00
36	202	48.778	-102.656	Gr/We	1	3.00	8.00	1.00	1.00	0.00	0.00	1.00	1.00
37	203	48.779	-102.807	Gr/We	1	8.00	22.00	2.00	30.00	2.00	3.00	4.00	33.00
38	206	48.780	-102.852	Gr/We	1	2.00	16.00	6.00	24.00	1.00	15.00	7.00	39.00
39	207	48.787	-102.808	Ag/Gr/We	2	5.00	26.50	8.00	81.00	2.50	5.00	10.50	86.00
40	208	48.805	-102.852	Ag/We	1	3.00	32.00	5.00	28.00	0.00	0.00	5.00	28.00
41	209	48.819	-102.874	Ag/We	2	2.50	16.00	4.00	38.00	2.50	19.50	6.50	57.50
42	210	48.764	-102.814	Ag/We	1	3.00	17.00	6.00	28.00	4.00	12.00	10.00	40.00
43	211	48.764	-102.821	Gr/We	1	1.00	12.00	9.00	24.00	2.00	2.00	11.00	26.00
44	212	48.764	-102.828	Gr/We	1	4.00	5.00	6.00	44.00	4.00	17.00	10.00	61.00
45	213	48.807	-102.826	Ag/Gr/We	1	3.00	7.00	1.00	3.00	1.00	1.00	2.00	4.00

Table A. Average Species Richness and Relative Abundance for Habitat-Associated Species Groups within the Burke County Wind Project (Burke County, North Dakota)

Point Count Station	Count Station Field ID	Lat.	Long.	Habitat	No. Visits	Grassland Birds		Waterfowl		Waterbirds		Waterfowl + Waterbirds Combined	
						Species Richness	Relative Abundance	Species Richness	Relative Abundance	Species Richness	Relative Abundance	Species Richness	Relative Abundance
46	214	48.807	-102.815	Ag/Gr	2	3.50	12.00	4.00	8.00	1.50	2.00	5.50	10.00
47	216	48.807	-102.821	Ag	1	2.00	6.00	0.00	0.00	1.00	5.00	1.00	5.00
48	217	48.820	-102.896	Ag/We	2	2.00	4.00	4.00	24.50	3.00	15.00	7.00	39.50
49	221	48.808	-102.838	Ag/We	1	5.00	11.00	0.00	0.00	1.00	1.00	1.00	1.00
50	222	48.807	-102.849	Ag/We	1	5.00	20.00	9.00	46.00	4.00	12.00	13.00	58.00
51	224	48.807	-102.868	Ag/We	1	3.00	38.00	11.00	61.00	6.00	90.00	17.00	151.00
52	225	48.764	-102.860	Ag/We	1	2.00	18.00	6.00	54.00	2.00	7.00	8.00	61.00
53	226	48.764	-102.867	Ag	1	6.00	38.00	4.00	14.00	3.00	49.00	7.00	63.00
54	227	48.807	-102.878	Ag/We	2	2.50	7.50	5.50	36.00	3.50	41.00	8.50	77.00

Point Count Station is the location number used to identify individual survey points. Count Station Field ID, the internal identification number for each survey visit, is not necessarily sequential, as some point count stations contained multiple visits and some visits were considered incidental and therefore not included in the analyses.

Habitat codes: Ag = agriculture, Gr= grassland, We= wetland. Slash codes indicate that multiple habitat types are present at the point.

No. Visits is the number of times a particular point was visited during the surveys.

Species Richness is the average number of species within a particular species group observed at a particular point count station.

Relative Abundance is the total number of individual birds within a particular species group observed at each point count station divided by the total number of visits to that point count station.

Table B. Average Species Richness and Relative Abundance for Habitat-Associated Species Groups outside the Burke County Wind Project (Burke County, North Dakota)

Point Count Station	Count Station Field ID	Lat.	Long.	Habitat	No. Visits	Grassland Birds		Waterfowl		Waterbirds		Waterfowl + Waterbirds Combined	
						Species Richness	Relative Abundance	Species Richness	Relative Abundance	Species Richness	Relative Abundance	Species Richness	Relative Abundance
55	110	48.807	-102.925	Ag/We	1	1.00	7.00	1.00	5.00	3.00	5.00	4.00	10.00
56	112	48.735	-102.623	Ag/Gr/We	1	4.00	23.00	5.00	34.00	6.00	48.00	11.00	82.00
57	113	48.735	-102.617	Gr/We	2	4.00	18.00	4.00	32.00	2.50	5.50	6.50	37.50
58	115	48.707	-102.461	Gr/We	1	5.00	6.00	4.00	34.00	0.00	0.00	4.00	34.00
59	116	48.711	-102.462	Gr/We	2	6.50	23.50	1.50	5.00	4.50	21.00	6.00	26.00
60	117	48.715	-102.516	Gr/We	2	5.00	46.00	5.00	46.00	3.50	15.00	8.50	61.00
61	119	48.720	-102.516	Gr/We	1	8.00	41.00	1.00	49.00	2.00	10.00	3.00	59.00
62	125	48.720	-102.438	Gr/We	3	5.33	21.00	4.67	8.00	6.67	38.33	11.33	46.33
63	126	48.720	-102.432	Gr/We	3	6.33	25.00	2.33	3.00	3.33	11.00	5.67	14.00
64	127	48.720	-102.444	Gr/We	3	5.67	20.00	3.67	16.33	3.67	17.67	7.33	34.00
65	128	48.720	-102.451	Gr/We	3	9.00	24.33	4.67	38.00	5.33	21.67	10.00	59.67
66	140	48.699	-102.514	Ag/We	2	7.50	44.00	6.50	57.00	7.50	25.00	14.00	82.00
67	145	48.735	-102.606	Gr/We	1	6.00	19.00	2.00	4.00	4.00	12.00	6.00	16.00
68	151	48.710	-102.473	We	2	3.00	22.50	2.00	5.50	4.00	15.50	6.00	21.00
69	154	48.717	-102.451	Gr/We	2	4.00	16.00	4.00	26.00	5.00	20.00	9.00	46.00
70	160	48.705	-102.516	Ag/We	2	6.50	48.50	6.00	26.50	1.50	132.50	7.50	159.00
71	161	48.706	-102.499	Gr/We	1	3.00	8.00	5.00	51.00	8.00	52.00	13.00	103.00
72	162	48.706	-102.508	Ag	1	6.00	91.00	1.00	1.00	2.00	8.00	3.00	9.00
73	163	48.706	-102.502	Ag/We	1	6.00	12.00	0.00	0.00	2.00	2.00	2.00	2.00
74	172	48.749	-102.546	Ag/Gr/We	1	5.00	11.00	3.00	13.00	1.00	1.00	4.00	14.00
75	176	48.735	-102.541	Gr/We	2	4.00	14.00	3.00	18.50	1.50	14.00	4.50	32.50
76	177	48.735	-102.552	Ag/Gr/We	1	5.00	19.00	3.00	39.00	1.00	3.00	4.00	42.00
77	178	48.735	-102.555	Gr/We	1	3.00	12.00	1.00	2.00	1.00	2.00	2.00	4.00

Table B. Average Species Richness and Relative Abundance for Habitat-Associated Species Groups outside the Burke County Wind Project (Burke County, North Dakota)

Point Count Station	Count Station Field ID	Lat.	Long.	Habitat	No. Visits	Grassland Birds		Waterfowl		Waterbirds		Waterfowl + Waterbirds Combined	
						Species Richness	Relative Abundance	Species Richness	Relative Abundance	Species Richness	Relative Abundance	Species Richness	Relative Abundance
78	179	48.735	-102.572	Gr/We	2	5.00	16.00	4.50	48.00	4.00	94.00	8.50	142.00
79	180	48.735	-102.586	Ag/Gr/We	2	5.00	16.50	5.00	48.00	3.00	9.50	8.00	57.50
80	183	48.778	-102.730	Ag/We	1	4.00	14.00	1.00	2.00	1.00	1.00	2.00	3.00
81	192	48.778	-102.760	Ag/Gr	2	8.50	30.50	0.00	0.00	2.00	2.50	2.00	2.50
82	204	48.781	-102.655	Gr	1	3.00	12.00	0.00	0.00	1.00	3.00	1.00	3.00
83	205	48.800	-102.918	Ag/We	1	4.00	7.00	1.00	4.00	1.00	13.00	2.00	17.00
84	220	48.826	-102.896	Gr/We	2	2.50	18.50	5.00	19.50	2.00	6.00	7.00	25.50
85	223	48.826	-102.874	Gr	1	2.00	8.00	0.00	0.00	2.00	2.00	2.00	2.00
86	230	48.718	-102.473	Gr/We	1	6.00	14.00	1.00	3.00	2.00	5.00	3.00	8.00
87	500	48.721	-102.480	Gr/We	4	5.50	16.50	4.25	25.50	2.25	7.00	6.50	32.50
88	501	48.778	-102.719	Ag/Gr/We	2	7.00	19.00	5.00	21.50	1.00	3.50	6.00	25.00
89	108	48.789	-102.918	Ag/We	1	5.00	36.00	4.00	17.00	2.00	12.00	6.00	29.00
90	120	48.720	-102.400	Ag/Gr/We	3	6.00	20.00	0.00	0.00	2.33	7.00	2.33	7.00
91	121	48.720	-102.404	Ag/Gr/We	1	5.00	9.00	2.00	4.00	0.00	0.00	2.00	4.00
92	122	48.720	-102.412	Gr	3	6.00	20.00	0.67	1.00	2.00	14.67	2.67	15.67
93	123	48.720	-102.416	Gr/We	2	6.50	16.00	0.50	1.00	2.00	5.50	2.50	6.50
94	124	48.720	-102.421	Gr/We	2	6.00	22.50	4.00	35.50	3.50	26.50	7.50	62.00
95	129	48.721	-102.426	Gr/We	1	7.00	34.00	7.00	28.00	4.00	13.00	11.00	41.00
96	130	48.749	-102.452	Ag	1	7.00	13.00	0.00	0.00	1.00	1.00	1.00	1.00
97	131	48.749	-102.463	Ag/We	1	5.00	67.00	0.00	0.00	1.00	1.00	1.00	1.00
98	132	48.720	-102.569	Gr/We	2	5.50	19.00	1.50	5.00	3.50	24.00	5.00	29.00
99	133	48.721	-102.560	Gr/We	2	7.00	29.00	4.00	19.00	6.00	21.50	10.00	40.50

Table B. Average Species Richness and Relative Abundance for Habitat-Associated Species Groups outside the Burke County Wind Project (Burke County, North Dakota)

Point Count Station	Count Station Field ID	Lat.	Long.	Habitat	No. Visits	Grassland Birds		Waterfowl		Waterbirds		Waterfowl + Waterbirds Combined	
						Species Richness	Relative Abundance	Species Richness	Relative Abundance	Species Richness	Relative Abundance	Species Richness	Relative Abundance
100	134	48.677	-102.531	Ag	2	5.00	29.00	0.50	4.00	1.00	2.00	1.50	6.00
101	135	48.778	-102.587	Ag	1	3.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00
102	136	48.721	-102.596	Gr/We	1	4.00	18.00	5.00	31.00	6.00	11.00	11.00	42.00
103	137	48.720	-102.607	Gr/We	1	7.00	52.00	5.00	28.00	8.00	60.00	13.00	88.00
104	138	48.695	-102.538	Gr/We	1	6.00	27.00	11.00	95.00	2.00	10.00	13.00	105.00
105	139	48.690	-102.518	Gr/We	1	5.00	22.00	2.00	4.00	1.00	2.00	3.00	6.00
106	141	48.720	-102.618	Gr/We	1	8.00	58.00	8.00	119.00	7.00	118.00	15.00	237.00
107	142	48.720	-102.612	Gr/We	1	2.00	14.00	11.00	75.00	3.00	66.00	14.00	141.00
108	143	48.680	-102.516	Gr/We	2	4.50	29.00	6.50	75.50	3.50	6.50	10.00	82.00
109	144	48.720	-102.623	Ag/We	1	6.00	60.00	6.00	108.00	6.00	203.00	12.00	311.00
110	146	48.680	-102.473	Gr/We	1	4.00	46.00	3.00	7.00	4.00	26.00	7.00	33.00
111	148	48.713	-102.641	Gr/We	2	6.00	32.00	6.50	41.00	5.00	30.50	11.50	71.50
112	170	48.720	-102.580	Gr/We	2	7.00	18.50	5.00	23.50	4.50	41.50	9.50	65.00
113	175	48.744	-102.481	Gr	1	2.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
114	196	48.766	-102.918	Ag/We	1	6.00	77.00	4.00	35.00	1.00	1.00	5.00	36.00
115	197	48.774	-102.918	Gr/We	1	3.00	54.00	1.00	2.00	2.00	8.00	3.00	10.00

Point Count Station is the location number used to identify individual survey points. Count Station Field ID, the internal identification number for each survey visit, is not necessarily sequential, as some point count stations contained multiple visits and some visits were considered incidental and not included in the analyses.

Habitat codes: Ag = agriculture, Gr= grassland, We= wetland. Slash codes indicate that multiple habitat types are present at the point.

No. Visits is the number of times a particular point was visited during the surveys.

Species Richness is the average number of species within a particular species group observed at a particular point count station.

Relative Abundance is the total number of individual birds within a particular species group observed at each point count station divided by the total number of visits to that point count station.

APPENDIX III

Species Observed during Breeding Bird Assessments

Appendix III. Species Observed during Breeding Bird Assessments—Burke County Wind Project (Burke County, North Dakota)

Common Name	Scientific Name	Proportion of Occurrence-200 MW	Proportion of Occurrence-Outside 200 MW	Relative Abundance-200 MW	Std. Dev.	Relative Abundance-Outside 200 MW	Std. Dev.	State Status
Alder Flycatcher†	<i>Empidonax alnorum</i>	1.9%	0.0%	0.01	0.12	0.00	0.00	
American Avocet	<i>Recurvirostra americana</i>	7.4%	1.6%	0.20	0.98	0.01	0.10	SCP II
American Bittern	<i>Botaurus lentiginosus</i>	0.0%	1.6%	0.00	0.00	0.01	0.10	SCP I
American Coot	<i>Fulica americana</i>	25.9%	32.8%	1.31	3.64	0.87	2.34	
American Crow†	<i>Corvus brachyrhynchos</i>	11.1%	21.3%	0.10	0.34	0.26	0.67	
American Goldfinch†	<i>Spinus tristis</i>	37.0%	44.3%	0.65	1.32	0.62	1.06	
American Robin†	<i>Turdus migratorius</i>	35.2%	29.5%	0.42	0.69	0.33	0.70	
American White Pelican	<i>Pelecanus erythrorhynchos</i>	1.9%	3.3%	0.03	0.24	0.04	0.29	SCP II
American Wigeon	<i>Mareca americana</i>	35.2%	21.3%	0.77	1.49	0.69	2.19	
Baltimore Oriole†	<i>Icterus galbula</i>	3.7%	4.9%	0.03	0.17	0.03	0.17	
Bank Swallow†	<i>Riparia riparia</i>	3.7%	9.8%	0.03	0.17	0.11	0.52	
Barn Swallow†	<i>Hirundo rustica</i>	42.6%	42.6%	1.15	2.15	1.09	2.02	
Black Tern	<i>Chlidonias niger</i>	20.4%	49.2%	0.56	1.69	2.37	4.41	SCP I
Black-billed Magpie†	<i>Pica hudsonia</i>	1.9%	4.9%	0.07	0.59	0.10	0.74	
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	18.5%	9.8%	0.24	0.84	0.06	0.24	
Blue-winged Teal	<i>Spatula discors</i>	59.3%	57.4%	6.41	8.19	2.93	5.60	
Bobolink	<i>Dolichonyx oryzivorus</i>	29.6%	49.2%	0.76	1.74	0.94	1.46	SCP II
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	11.1%	34.4%	0.34	1.18	1.23	3.27	
Brown Thrasher†	<i>Toxostoma rufum</i>	11.1%	8.2%	0.08	0.28	0.06	0.28	
Brown-headed Cowbird	<i>Molothrus ater</i>	48.1%	75.4%	1.32	2.32	1.86	4.34	
Bufflehead	<i>Bucephala albeola</i>	1.9%	4.9%	0.15	0.92	0.21	1.65	
California Gull	<i>Larus californicus</i>	3.7%	1.6%	0.03	0.17	0.03	0.30	
Canada Goose	<i>Branta canadensis</i>	7.4%	9.8%	0.44	2.36	2.44	11.41	
Canvasback	<i>Aythya valisineria</i>	7.4%	19.7%	0.23	1.06	0.79	2.51	SCP II
Cedar Waxwing†	<i>Bombycilla cedrorum</i>	9.3%	16.4%	0.13	0.51	0.24	0.83	

Appendix III. Species Observed during Breeding Bird Assessments—Burke County Wind Project (Burke County, North Dakota)

Common Name	Scientific Name	Proportion of Occurrence-200 MW	Proportion of Occurrence-Outside 200 MW	Relative Abundance-200 MW	Std. Dev.	Relative Abundance-Outside 200 MW	Std. Dev.	State Status
Chipping Sparrow†	<i>Spizella passerina</i>	1.9%	3.3%	0.01	0.12	0.02	0.14	
Clay-colored Sparrow	<i>Spizella pallida</i>	68.5%	75.4%	2.46	2.69	2.05	2.54	
Cliff Swallow†	<i>Petrochelidon pyrrhonota</i>	11.1%	16.4%	0.18	0.64	0.16	0.55	
Common Grackle†	<i>Quiscalus quiscula</i>	37.0%	47.5%	1.62	3.89	2.57	7.22	
Common Raven†	<i>Corvus corax</i>	1.9%	4.9%	0.06	0.37	0.15	0.88	
Common Yellowthroat	<i>Geothlypis trichas</i>	40.7%	29.5%	0.49	0.73	0.26	0.51	
Cooper's Hawk†	<i>Accipiter cooperii</i>	1.9%	1.6%	0.01	0.12	0.01	0.10	
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	9.3%	27.9%	0.45	2.98	0.62	1.55	
Eared Grebe	<i>Podiceps nigricollis</i>	7.4%	8.2%	0.93	6.58	0.12	0.58	
Eastern Kingbird†	<i>Tyrannus tyrannus</i>	51.9%	47.5%	0.66	0.94	0.60	0.76	
Eastern Phoebe†	<i>Sayornis phoebe</i>	1.9%	1.6%	0.01	0.12	0.01	0.10	
European Starling†	<i>Sturnus vulgaris</i>	3.7%	13.1%	0.14	0.85	0.30	1.28	
Forster's Tern	<i>Sterna forsteri</i>	0.0%	4.9%	0.00	0.00	0.24	1.47	
Franklin's Gull	<i>Leucophaeus pipixcan</i>	68.5%	83.6%	12.25	44.72	14.87	37.80	SCP I
Gadwall	<i>Mareca strepera</i>	59.3%	55.7%	5.15	8.02	2.57	4.99	
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	1.9%	8.2%	0.04	0.36	0.21	0.75	SCP I
Gray Catbird†	<i>Dumetella carolinensis</i>	9.3%	6.6%	0.08	0.33	0.04	0.20	
Gray Partridge†	<i>Perdix perdix</i>	0.0%	1.6%	0.00	0.00	0.01	0.10	
Great Blue Heron ^Δ	<i>Ardea herodias</i>	n/a	n/a	-	-	-	-	
Greater Scaup	<i>Aythya marila</i>	0.0%	1.6%	0.00	0.00	0.02	0.20	
Greater Yellowlegs ^α	<i>Tringa melanoleuca</i>	14.8%	6.6%	0.27	0.96	0.06	0.35	
Green-winged Teal	<i>Anas crecca</i>	16.7%	23.0%	0.49	1.40	0.66	2.08	
Herring Gull	<i>Larus argentatus</i>	0.0%	1.6%	0.00	0.00	0.01	0.10	
Horned Grebe	<i>Podiceps auritus</i>	1.9%	1.6%	0.01	0.12	0.04	0.29	SCP I
Horned Lark†	<i>Eremophila alpestris</i>	14.8%	14.8%	0.18	0.57	0.26	0.85	

Appendix III. Species Observed during Breeding Bird Assessments—Burke County Wind Project (Burke County, North Dakota)

Common Name	Scientific Name	Proportion of Occurrence-200 MW	Proportion of Occurrence-Outside 200 MW	Relative Abundance-200 MW	Std. Dev.	Relative Abundance-Outside 200 MW	Std. Dev.	State Status
House Sparrow†	<i>Passer domesticus</i>	1.9%	1.6%	0.01	0.12	0.02	0.20	
House Wren†	<i>Troglodytes aedon</i>	25.9%	11.5%	0.21	0.44	0.09	0.36	
Killdeer†	<i>Charadrius vociferus</i>	55.6%	62.3%	0.83	1.29	0.92	1.36	
Least Flycatcher†	<i>Empidonax minimus</i>	13.0%	13.1%	0.13	0.41	0.14	0.54	
Least Sandpiper ^α	<i>Calidris minutilla</i>	1.9%	0.0%	0.03	0.24	0.00	0.00	
Lesser Scaup	<i>Aythya affinis</i>	64.8%	67.2%	5.80	8.94	4.28	6.81	SCP II
Lesser Yellowlegs ^α	<i>Tringa flavipes</i>	18.5%	19.7%	0.87	3.44	0.32	1.24	
Mallard	<i>Anas platyrhynchos</i>	63.0%	62.3%	3.76	6.97	3.87	5.95	
Marbled Godwit	<i>Limosa fedoa</i>	3.7%	3.3%	0.04	0.26	0.06	0.38	SCP I
Marsh Wren†	<i>Cistothorus palustris</i>	31.5%	26.2%	0.58	1.40	0.37	0.93	
Mourning Dove†	<i>Zenaida macroura</i>	20.4%	41.0%	0.27	0.83	0.45	1.06	
Nelson's Sparrow	<i>Ammodramus nelsoni</i>	1.9%	1.6%	0.01	0.12	0.02	0.20	SCP I
Northern Flicker†	<i>Colaptes auratus</i>	3.7%	4.9%	0.03	0.17	0.03	0.17	
Northern Harrier	<i>Circus hudsonius</i>	7.4%	6.6%	0.07	0.26	0.04	0.20	SCP II
Northern Pintail	<i>Anas acuta</i>	18.5%	6.6%	0.52	1.58	0.08	0.47	SCP II
Northern Shoveler	<i>Spatula clypeata</i>	38.9%	31.1%	1.70	3.68	0.73	1.98	
Orchard Oriole†	<i>Icterus spurius</i>	7.4%	3.3%	0.06	0.23	0.03	0.23	
Pied-billed Grebe	<i>Podilymbus podiceps</i>	20.4%	18.0%	0.28	0.70	0.46	1.55	
Purple Martin†	<i>Progne subis</i>	0.0%	3.3%	0.00	0.00	0.02	0.14	
Redhead	<i>Aythya americana</i>	29.6%	31.1%	1.65	5.24	2.34	6.11	
Red-necked Grebe	<i>Podiceps grisegena</i>	7.4%	18.0%	0.15	0.53	0.45	1.38	
Red-tailed Hawk†	<i>Buteo jamaicensis</i>	20.4%	27.9%	0.21	0.53	0.25	0.58	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	90.7%	88.5%	13.90	13.91	13.32	15.77	
Ring-billed Gull	<i>Larus delawarensis</i>	25.9%	36.1%	0.30	0.72	0.51	1.55	
Ring-necked Duck	<i>Aythya collaris</i>	1.9%	6.6%	0.03	0.24	0.15	0.81	

Appendix III. Species Observed during Breeding Bird Assessments—Burke County Wind Project (Burke County, North Dakota)

Common Name	Scientific Name	Proportion of Occurrence-200 MW	Proportion of Occurrence-Outside 200 MW	Relative Abundance-200 MW	Std. Dev.	Relative Abundance-Outside 200 MW	Std. Dev.	State Status
Ring-necked Pheasant†	<i>Phasianus colchicus</i>	25.9%	16.4%	0.37	0.87	0.11	0.35	
Rock Pigeon†	<i>Columba livia</i>	3.7%	1.6%	0.35	2.40	0.03	0.30	
Ruddy Duck	<i>Oxyura jamaicensis</i>	31.5%	29.5%	1.87	6.64	1.03	3.11	
Savannah Sparrow	<i>Passerculus sandwichensis</i>	61.1%	73.8%	1.82	2.31	2.41	2.57	
Say's Phoebe†	<i>Sayornis saya</i>	1.9%	1.6%	0.03	0.24	0.01	0.10	
Sedge Wren	<i>Cistothorus platensis</i>	11.1%	1.6%	0.10	0.34	0.01	0.10	
Semipalmated Sandpiper ^α	<i>Calidris pusilla</i>	1.9%	0.0%	0.01	0.12	0.00	0.00	
Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>	5.6%	3.3%	0.04	0.20	0.02	0.14	SCP II
Song Sparrow†	<i>Melospiza melodia</i>	59.3%	50.8%	0.80	0.95	0.90	1.41	
Sora	<i>Porzana carolina</i>	11.1%	9.8%	0.10	0.34	0.10	0.42	
Spotted Sandpiper	<i>Actitis macularius</i>	18.5%	13.1%	0.18	0.49	0.09	0.29	
Sprague's Pipit	<i>Anthus spragueii</i>	0.0%	1.6%	0.00	0.00	0.04	0.32	SCP I
Swainson's Hawk	<i>Buteo swainsoni</i>	0.0%	6.6%	0.00	0.00	0.04	0.20	SCP I
Tree Swallow†	<i>Tachycineta bicolor</i>	25.9%	26.2%	0.73	1.89	0.46	1.51	
Turkey Vulture†	<i>Cathartes aura</i>	0.0%	1.6%	0.00	0.00	0.01	0.10	
Upland Sandpiper	<i>Bartramia longicauda</i>	16.7%	39.3%	0.25	0.89	0.56	1.07	SCP II
Veery ^Δ	<i>Catharus fuscescens</i>	n/a	n/a	-	-	-	-	
Vesper Sparrow	<i>Pooecetes gramineus</i>	22.2%	37.7%	0.20	0.47	0.42	0.76	
Warbling Vireo†	<i>Vireo gilvus</i>	5.6%	13.1%	0.06	0.23	0.10	0.37	
Western Grebe	<i>Aechmophorus occidentalis</i>	0.0%	1.6%	0.00	0.00	0.01	0.10	
Western Kingbird	<i>Tyrannus verticalis</i>	9.3%	11.5%	0.10	0.38	0.09	0.36	
Western Meadowlark	<i>Sturnella neglecta</i>	31.5%	47.5%	0.42	0.86	1.22	1.58	SCP II
White-faced Ibis ^α	<i>Plegadis chihi</i>	0.0%	3.3%	0.00	0.00	0.06	0.52	
Willet	<i>Tringa semipalmata</i>	16.7%	11.5%	0.25	0.75	0.10	0.39	SCP II
Willow Flycatcher†	<i>Empidonax traillii</i>	3.7%	0.0%	0.04	0.26	0.00	0.00	

Appendix III. Species Observed during Breeding Bird Assessments—Burke County Wind Project (Burke County, North Dakota)

Common Name	Scientific Name	Proportion of Occurrence-200 MW	Proportion of Occurrence-Outside 200 MW	Relative Abundance-200 MW	Std. Dev.	Relative Abundance-Outside 200 MW	Std. Dev.	State Status
Wilson's Phalarope	<i>Phalaropus tricolor</i>	24.1%	16.4%	0.41	1.55	0.23	0.81	SCP I
Wilson's Snipe	<i>Gallinago delicata</i>	16.7%	45.9%	0.17	0.45	0.62	0.82	
Yellow Warbler†	<i>Setophaga petechia</i>	44.4%	36.1%	0.49	0.73	0.51	0.88	
Yellow-headed Blackbird†	<i>Xanthocephalus xanthocephalus</i>	44.4%	47.5%	4.54	8.60	1.92	4.04	

A dagger (†) following a species common name indicates that the species was not included in analyses for species groupings in Appendix II.

A superscript delta (Δ) following a species common name indicates that the species was only detected incidentally.

A superscript alpha (α) following a species common name indicates that the species does not breed locally and was detected during surveys as an early fall migrant, and was not included in Appendix II species groupings.

Proportion of occurrence is equal to the total number of point count stations where the species was observed divided by the total number of point count stations (54 for the Project and 61 for outside the Project but within the Avian Use Study Area), shown in the table as a percentage.

Relative abundance is equal to the total number of individuals observed for each species divided by the total number of visits (71 for the Project and 97 for outside the Project but within the Avian Use Study Area). The total number of visits is greater than the number of point count stations as some stations were visited multiple times. Standard deviation (Std. Dev.) is also provided.

State conservation listing status indicates North Dakota State Wildlife Action Plan (Dyke et al. 2015) Species of Conservation Priority (SCP) Level I, II, or III. No federally threatened or endangered species were detected during surveys.

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