NORTH Dakota | Game and Fish
Be Legendary.™

RECEIVED

JUN - 1 2022

NORTH DAKOTA
PUBLIC SERVICE COMMISSION

May 27, 2022

ND Public Service Commission
600 E. Boulevard, Dept. 408
Bismarck, ND 58505-0480

RE: Badger Wind Project, Logan and McIntosh counties, North Dakota

Mr. Kahl,

The North Dakota Game and Fish Department (Department) first learned of the proposed Badger Wind Project in early 2020. Many of the early discussions on the project centered around the Department's serious concerns of the project boundary (Guidance Letter, Attachment 1). The area, specifically the northern part, has a considerable amount of unbroken, native prairie (Attachment 2). This habitat is essential for many rare and declining species, such as grassland dependent birds. These birds, our 'canaries in the coal mine', have shown "steeper, more consistent, and more geographically widespread declines than any other behavioral or ecological guild" (Knopf 1994). Breeding Bird Survey data collected from 1966-2015 show the state's bird, the Western Meadowlark, declines approximately 1.25% each year. Once abundant throughout the state, the Western Meadowlark has lost over half of its population in North Dakota and is now considered rare in the eastern counties. Another example, the Chestnut-collared Longspur, has decreased by 86% since 1974 (Rosenberg et al. 2016) and is listed as a Species of Conservation Priority in the North Dakota State Wildlife Action Plan (Dyke et. al 2015) and is on the IUCN Red List as Vulnerable and is considered globally threatened. In 2020, the project layout provided to the Department had over 20 turbines being placed in unbroken prairie crucial to Longspurs in North Dakota (Attachment 3 & 4).

In February of this year, Badger provided an updated turbine layout. This new turbine layout is a great improvement from the original layout, with many turbines moved away from areas of important habitat. However, because the site originally selected for the project fell partially within a resource rich and sensitive area (Attachment 5a & 5b) and surrounded a vast amount of native habitats (both grasslands and wetlands), even with the changes made there are likely to be significant impacts to wildlife and the habitats they depend on (Attachment 6).

With this understanding, Orsted scheduled a number of meetings with the Department to discuss impacts and minimization/mitigation measures. Both the Department and Orsted ran an impact and offset analysis (Attachments 7 & 8, respectively) using the best available science. Based on these analyses, the Department and Orsted recognized that potential impacts included 7.2 acres of unbroken grasslands that would be lost, 632 acres of grasslands that would be impacted by avian displacement, and 160.4 breeding duck pairs that would be displaced. To address these

impacts, the Department recommended that Orsted restore 70 wetland acres (35 2-acre seasonal wetlands) and 334 acres of grasslands.

After several calls and email exchanges, it was the Departments understanding that Orsted was in agreement on both the impacts and offsets (Attachment 9). Unfortunately, after reaching back out to Orsted on May 19th, we were informed that they would not be making any commitments to address these impacts prior to the hearing but will continue to work with the Department and USFWS. However, the following comments must be made under the assumption that no efforts to address impacts will be made, as no commitment has been made within the permit application.

**Environmental Impacts of Wind Energy Development**

With an increased focus on reducing greenhouse gas emissions, clean energy resources are becoming more widespread. However, without appropriate planning, solutions intended to decrease emissions can turn into new challenges. Wind energy has a larger spatial footprint than other energy resources and, as the demand for energy continues to grow, that footprint could result in increased loss and fragmentation of habitat, additional listings under the Endangered Species Act (ESA), a loss in biodiversity, and ecosystem collapse. This poses a great risk to North Dakota, which harbors large, contiguous stands of native prairie, one of the most imperiled ecosystems globally.

*Collisions*

Research has shown that fatalities due to collisions ranges from three to six birds per MW per year ((Strickland et al. 2011; Loss et al. 2013; Erickson et al. 2014), and the number of birds killed is dependent on a variety of factors, including turbine and site features, species abundance and behavior, weather, and topography (Richardson, 2000; Erickson et al. 2001; Larsen & Clausen, 2002; Thelander et al., 2003; Drewitt & Langston, 2006; De lucas et al., 2008; Smallwood et al., 2009; Hull et al., 2013; Kitano & Shiraki, 2013). Studies have indicated that there may also be an increased risk of bird and bat collisions along migratory routes (Lewiss et al., 1992; Arnett et al., 2005; Huppop et al., 2006). North Dakota supports millions of migrating waterfowl, shorebirds, and other water birds, including the federally endangered whooping crane, and collisions during migration are of great concern in the state. Moreover, the placement of turbines in grassland-dominated landscapes is of higher concern because the diversity of species killed is nearly three times that of turbines placed in cropland (Graff et al. 2016).

Research has shown that bats are likely at even greater risk of collisions with wind turbines than birds (Howe et al., 2002; Kuvlesky et al., 2007; Molvar, 2008). Though bats often depend on trees and wooded areas for roosting, they can be found feeding over grassland and agricultural fields. Several species are known to occur in the prairie dominated landscape of North Dakota. Bats are long-lived, reproduce slowly, and migrate long distances, making them particularly susceptible to wind development. Three bat species, in particular, have been shown to be highly vulnerable to wind turbine collisions- Hoary Bat, Eastern Red Bat, and Silver-haired Bat (Kunz et al., 2007; Arnett et al., 2008)- all of which are found in North Dakota, though only the Silver-haired Bat can be considered common.

*Habitat Loss*

Habitat loss has been identified as the greatest threat to biodiversity (Wilcove et al., 1998). There is a vast amount of peer-reviewed literature linking habitat loss to reductions in population abundance, species richness, genetic diversity, population growth, breeding success, predation, and foraging success (Findlay & Houlahan, 1997; Bowsell et al., 1998; Sanchez-Zapata & Calvo, 1999; Mahan & Yahner, 1999.; Bergin et al., 2000; Best et al., 2001; Gibbs, 2001; Urban & Keitt, 2001; Steffan-Dewenter et al., 2002; Fahrig, 2002; Bascompte et al., 2002; Chalfoun et al., 2002; Herkert et al., 2003; Arnett et al., 2007). This is of high concern because it has been estimated that habitat conversion happens at a rate eight times that of habitat protection (Hoekstra et al., 2005). It is estimated that North Dakota has lost 72% of its original prairie, 60% of its wetlands, and 25% of its woodlands and shrublands. The rapid loss of native grasslands is of great concern, as this ecosystem supports a wide array of species and constitutes a large part of North Dakota's natural heritage and culture (NDPR, 1999). The loss, degradation, and fragmentation of grasslands has led to the decline of both game and non-game species, impacting everything from agriculture (pollinators) to hunting.

*Displacement and Avoidance*

Numerous studies have described the many stressors energy development can place on an ecosystem. Though many of these impacts are direct, observable, and quantifiable, some are not. One such stressor is the displacement of local wildlife. Many species are likely to avoid areas that have historically acted as source habitat due to anthropogenic disturbance and development. Displacement can occur during the construction and operational phases of a project as well as after the life of the project has been extinguished. This is likely caused by a number of reasons: light and noise pollution, increased traffic disturbance, visual obstruction, increases in undesirable vegetation, and changes in resource availability.

Quantifying displacement has proven to be a difficult task. Consequently, there has been minimal consensus of the extent of its impact, as it seems to vary greatly from site to site and species to species (Klein et al, 1995; Petersen, 2004; Drewitt et al., 2006; Kaiser et al., 2006; Stevens et al., 2013). However, avoidance behavior due to anthropogenic disturbance has been observed in a number of species (Lyon, 1979; Bock et al, 1999; Leddy et al., 1999; Weller et al., 2002; Holloran, 2005; Stewart et al., 2005; Benitez-Lopez , 2010; Loesch, et al., 2013; Shaffer & Buhl, 2015) and this avoidance has been shown to have long-term effects, such as increased predation of displaced species, reduced value of habitat for forage and reproduction, increased pressure on adjacent habitat, reduced gene flow, and altered landscape structure (Madsen, 1994; Phillips et al., 2000; Steidl et al., 2000; Herkert et al. 2003, Thompson et al., 2005; USFWS, 2016).

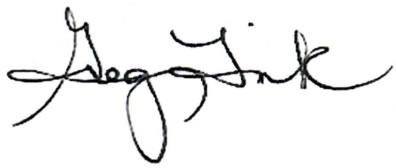
Of these studies, the most compelling involves research done within North Dakota. Work carried out by the United States Fish and Wildlife Service's Habitat And Population Evaluation Team found breeding duck pairs were highly impacted by the presence of wind turbines and the negative effects were found out to a half mile away from the turbines. Further, research done by the United States Geological Survey found that grassland dependent birds observed a 53% reduction within 300 meters from a turbine. These compelling numbers show that, even when the

habitat is not completely lost, there are detrimental impacts to wildlife due to the presence of large vertical structures.

**Conclusion**

As the state's lead wildlife agency, we recognize the important economic value provided to our state and its local communities from both wind energy development and our naturally occurring resources. We acknowledge the key role wind energy has in the 'all of the above' strategy for energy in North Dakota and understand the difficult challenges of managing the risk to public wildlife resources and their habitats while advancing renewable energy development. Nevertheless, this state is blessed with abundant opportunities to develop and site wind projects to best balance these two important resources. The Department does not believe the developers have fully addressed what is potentially "at stake" regarding the concerns we have brought forward both in coordination meetings and correspondence. Further, the Developer has been in agreement on potential impacts and the need to address them. As a result, the Department suggests that Orsted provide an updated Bird and Bat Conservation Strategy that addresses impacts prior to receiving a permit.

Sincerely,



Greg Link
Chief, Conservation and Communications Division

Cc: Sarah Aftergood, Orsted
Drew Becker, U.S. Fish and Wildlife Service

**Attachment 1. Early Guidance Letter**

*GOVERNOR Doug Burgum*

*DIRECTOR, Terry Steinwand*
*DEPUTY, Scott A. Peterson*

"VARIETY IN HUNTING AND FISHING"

**NORTH DAKOTA GAME AND FISH DEPARTMENT**

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

January 5, 2021

Chris McCreedy
Senior Environmental Consultant
ATWELL, LLC

RE: Badger Wind Project, Logan and McIntosh counties, ND

Dear Mr. McCreedy:

Thank you for your continued coordination with the North Dakota Game and Fish Department (Department) on the proposed Badger Wind Project. Based on recent conversations, the Department would like to use this opportunity to provide clearer guidance.

Native prairie (prairie that has not been plowed or broken in any way) is the most endangered ecosystem in North Dakota and, as we are a grassland state, the majority of our native species are linked to prairie. Disturbance, fragmentation, and loss of native prairie have adversely impacted a wide variety of species and these negative impacts will only continue to compound as more development takes place on the landscape. The remaining tracts of unbroken prairie are becoming more and more vital to many declining bird and pollinator species. This habitat supports 30 or more of the 115 Species of Conservation Priority identified in the North Dakota State Wildlife Action Plan (Dyke et. al 2015) and for species of conservation priority, such as the Chestnut-collared Longspur (Model, Attachment 1) which has declined 86% or the Loggerhead Shrike which has declined 74% since 1974 (Rosenberg et. al 2016), the loss and fragmentation of native prairie in the project area may further negatively impact these declining species.

Wetlands are another productive wildlife habitat in North Dakota, supporting 54 Species of Conservation Priority, as well as a considerable number of waterfowl, shorebirds and cranes throughout the year. Though the project area includes only a small number of wetlands, the resources they provide are still of value to many of our native species. The USFWS's Habitat and Population Evaluation Team (HAPET) has developed a Local Siting Decision Support Tool (DST) to estimate the number of duck pairs that are displaced based on research conducted in the

Dakotas (Loesch et al. 2013, Loesch 2016). We highly recommend Atwell contact HAPET office to request the DST to evaluate project impacts on wetland resources.

Finally, though the Department believes the best way to protect our species of conservation priority is by taking a habitat-focused approach, we would also like to reiterate the following species-specific concerns.

- Nearly 31% of the entire Sharp-tailed Grouse population falls within North Dakota and declines to the state's population will likely lead to range-wide population declines. Sharp-tailed Grouse are a high-valued upland game bird, and because research indicated that prairie grouse may be adversely affected by energy development, it is vital that lek surveys be conducted to understand the risk associated with development.

- Bats are long-lived, reproduce slowly, and migrate long distances, making them particularly susceptible to wind development. Acoustic surveys should begin at a minimum two years pre-construction to assess the risk the project poses to local bat populations.

- The Whooping Crane's migration corridor centers along the east side of the Missouri River. The project falls within the 75% core migration corridor and the northwest corner is considered to be core stopover habitat. A considerable number of Whooping Cranes have been observed along the river to the west of the project and at Long Lake to the north and it is possible they use resources within the project boundary as well. Contact the US Fish and Wildlife Habitat and Population Evaluation Team (HAPET) in Bismarck to request the Whooping Crane model of predicted use of landscapes.

- The Bald Eagle population and number of nest sites is increasing significantly in North Dakota. The number of nest sites has increased from 10 known sites in the year 2000 to more than 300 in the year 2017. Due to the continual increase and selection of non-traditional nest sites, it is possible that Bald Eagle nests may be found anywhere across the state where large trees are present. Therefore, it is recommended that Atwell conduct searches for raptor nests during the breeding season to understand the risk associated with development.

The Department has a number of resources available for the benefit of the developer and consultant, including maps and information on native habitats (see Native Prairie Model, Attachment 2), priority areas, and sensitive species. Core native habitat layers are available via Esri REST Services https://gf.nd.gov/maps/data then selecting North Dakota Game and Fish Department Species Range and Habitats. The Department also recommends working with the U.S. Fish and Wildlife Service, as any state recommendations do not relieve the developer of its obligations to comply with any applicable federal regulations.

As we continue to address the challenges of stemming the decline of our state's most sensitive species, we cannot endorse or consent to the disturbance, fragmentation, and loss of the remaining high value habitats essential to Species of Conservation Priority without recommending that suitable replacement or offsets be applied back onto the landscape. Ensuring these habitats remain

on the landscape is the only way to stem the decline of these species and prevent listings through the Endangered Species Act, which could impact both the state and its citizens. The Department has stressed the importance of following the best available science in determining impacts and voluntary offsets. The best science addressing North Dakota resources are Loesch et al. 2013 and Shaffer and Buhl 2016; these papers should be used to help guide Atwell in understanding impacts and developing a voluntary offset package, if one is deemed appropriate. For Further clarification on estimating grassland impacts, the Department is working on developing a guidance document which will also be shared.

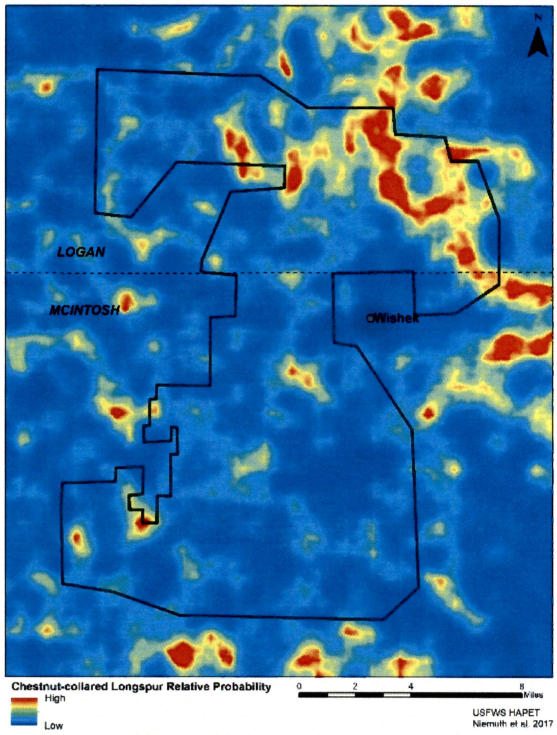
As Orsted moves forward with this project, the Department requests to remain informed. To accurately analyze the project and provide valuable feedback to the PSC, it is important that the Department receives all documents, including wildlife surveys, spatial data, and any voluntary offsets being proposed 100 days prior to the hearing date.

Sincerely,

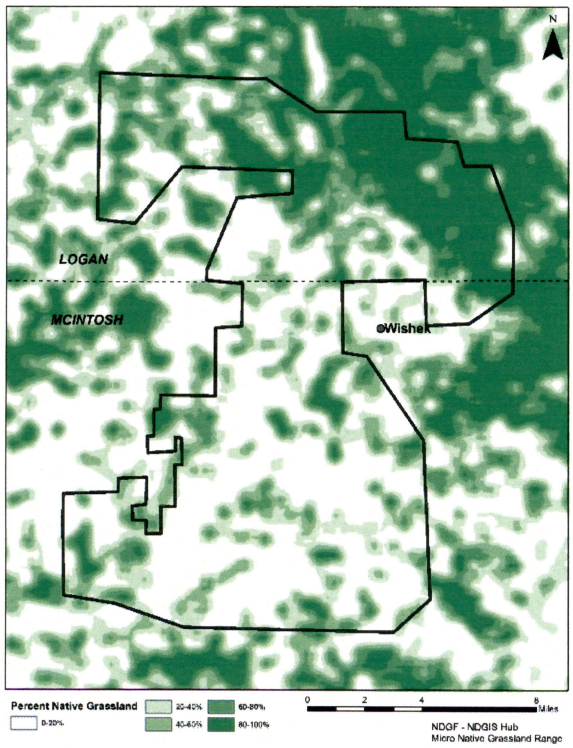
Greg Link
Chief, Conservation and Communications Division

Cc: Drew Becker, US Fish and Wildlife Service
ND Public Service Commission

Attachment 1. Chestnut-collared Longspur Model




Attachment 2. Native Prairie Model



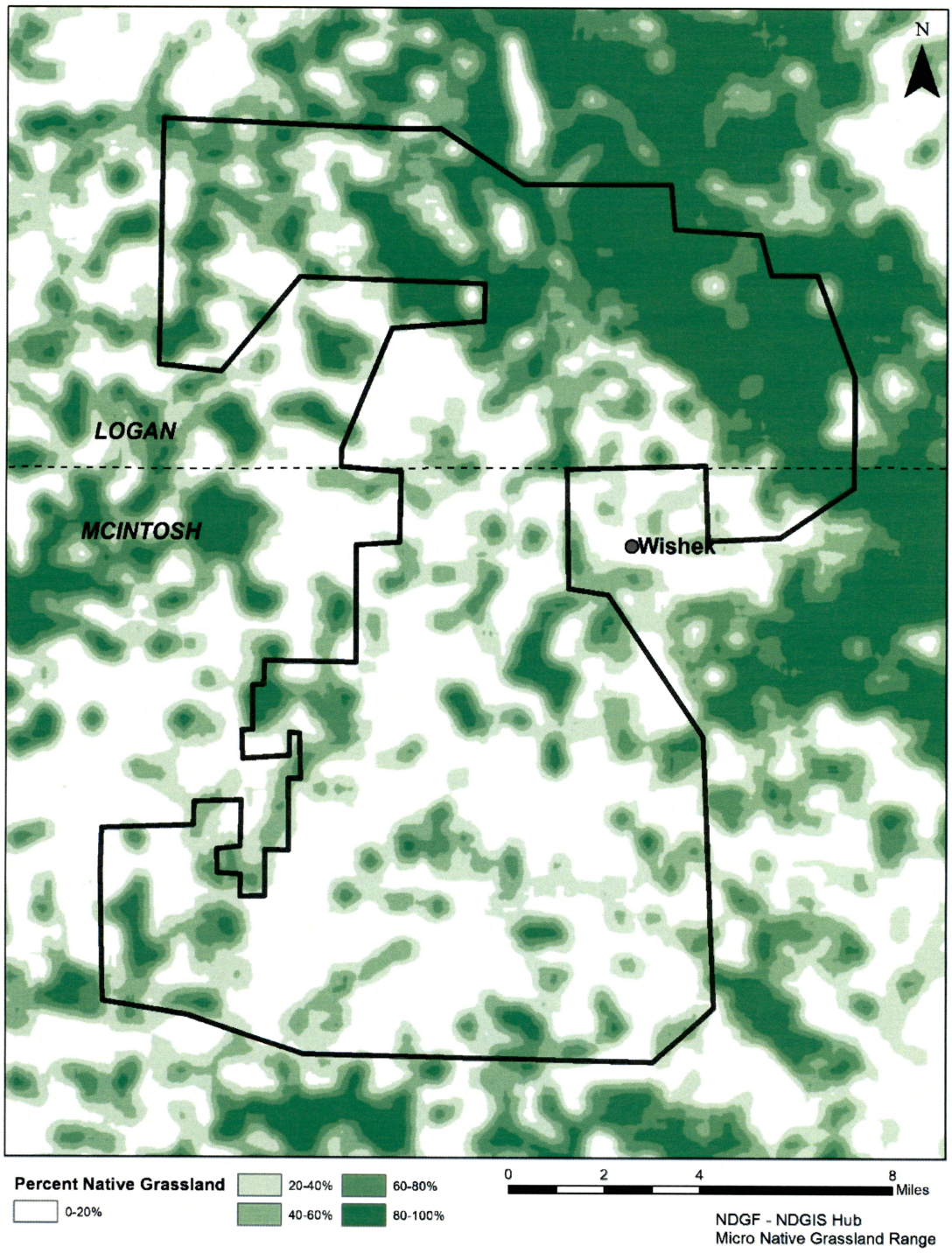

Governor
Doug Burgum

Director
Jeb Williams

Deputy Director
Scott A. Peterson

100 North Bismarck Expressway | Bismarck ND, 58504-5095 | (701) 328-6300 | Fax: (701) 328-6352

**Attachment 2. Native Prairie Model with original project boundary**



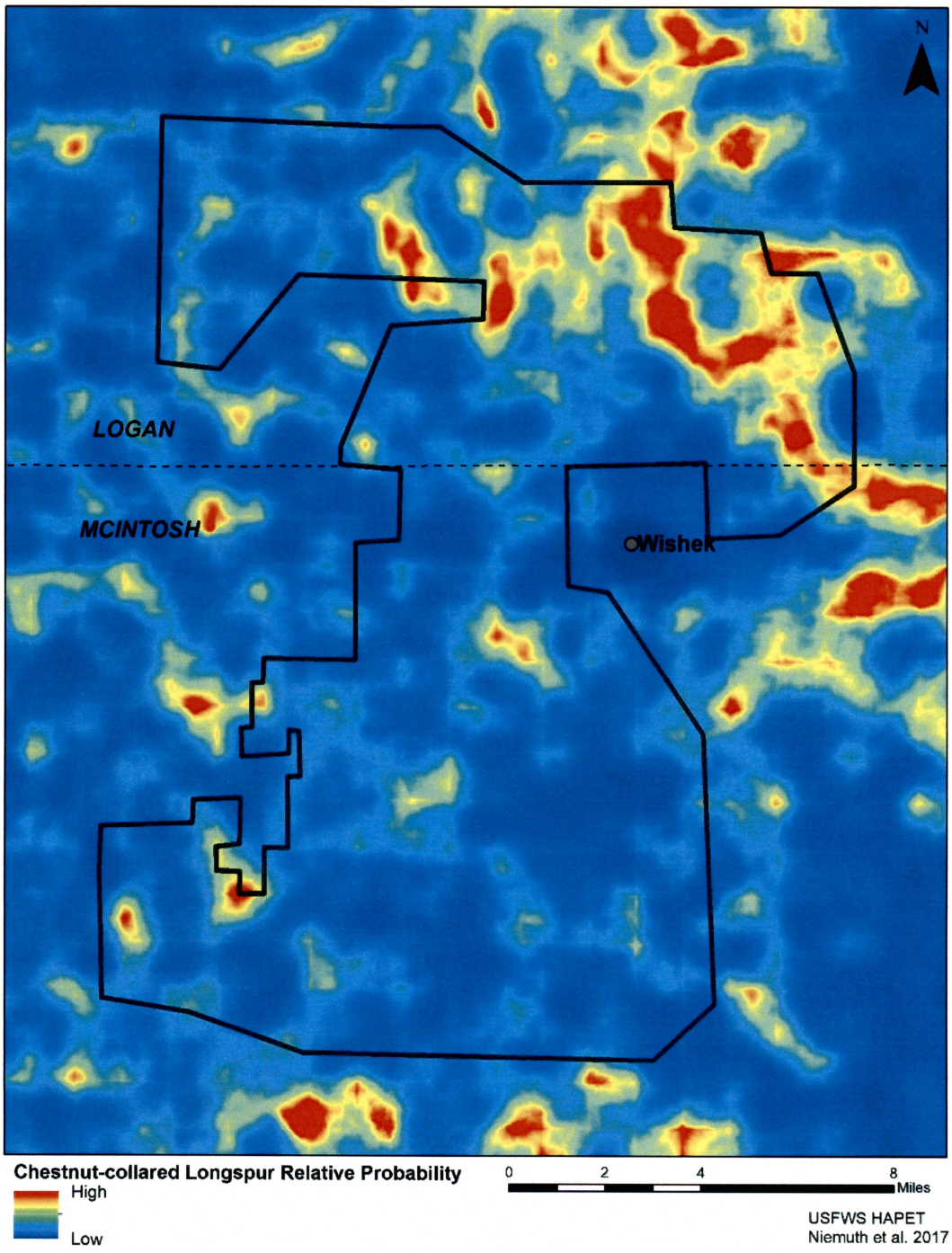

Governor
Doug Burgum

Director
Jeb Williams

Deputy Director
Scott A. Peterson

100 North Bismarck Expressway | Bismarck ND, 58504-5095 | (701) 328-6300 | Fax: (701) 328-6352

**Attachment 3. Chestnut-collared Longspur Model with original project boundary**



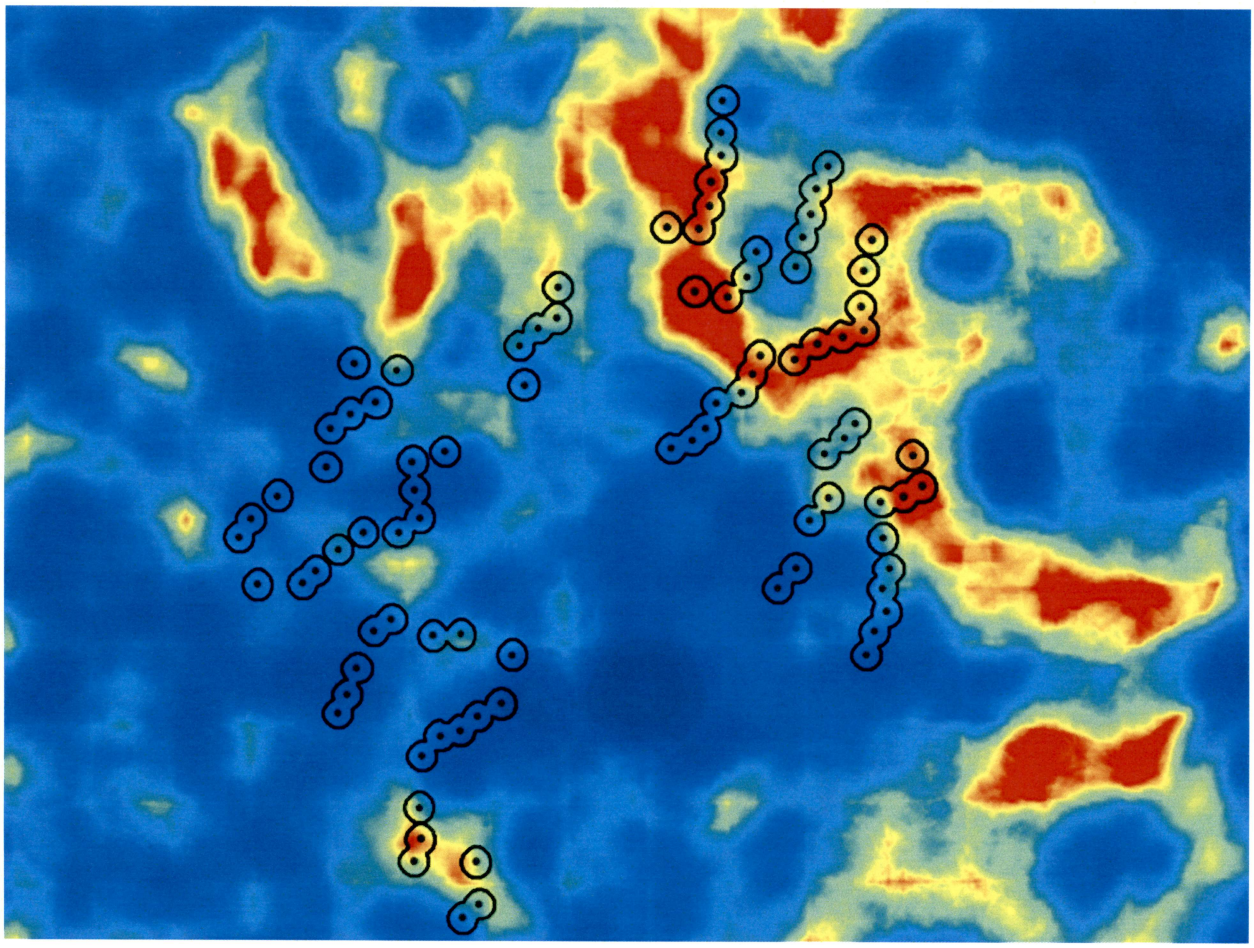

Governor
Doug Burgum

Director
Jeb Williams

Deputy Director
Scott A. Peterson

100 North Bismarck Expressway | Bismarck ND, 58504-5095 | (701) 328-6300 | Fax: (701) 328-6352

**Attachment 4. Chestnut-collared Longspur Model with original turbine layout**



Governor
Doug Burgum

Director
Jeb Williams

Deputy Director
Scott A. Peterson

100 North Bismarck Expressway | Bismarck ND, 58504-5095 | (701) 328-6300 | Fax: (701) 328-6352

**Attachment 5a. Final turbine layout and Key Native Wildlife and Habitat Areas Map**

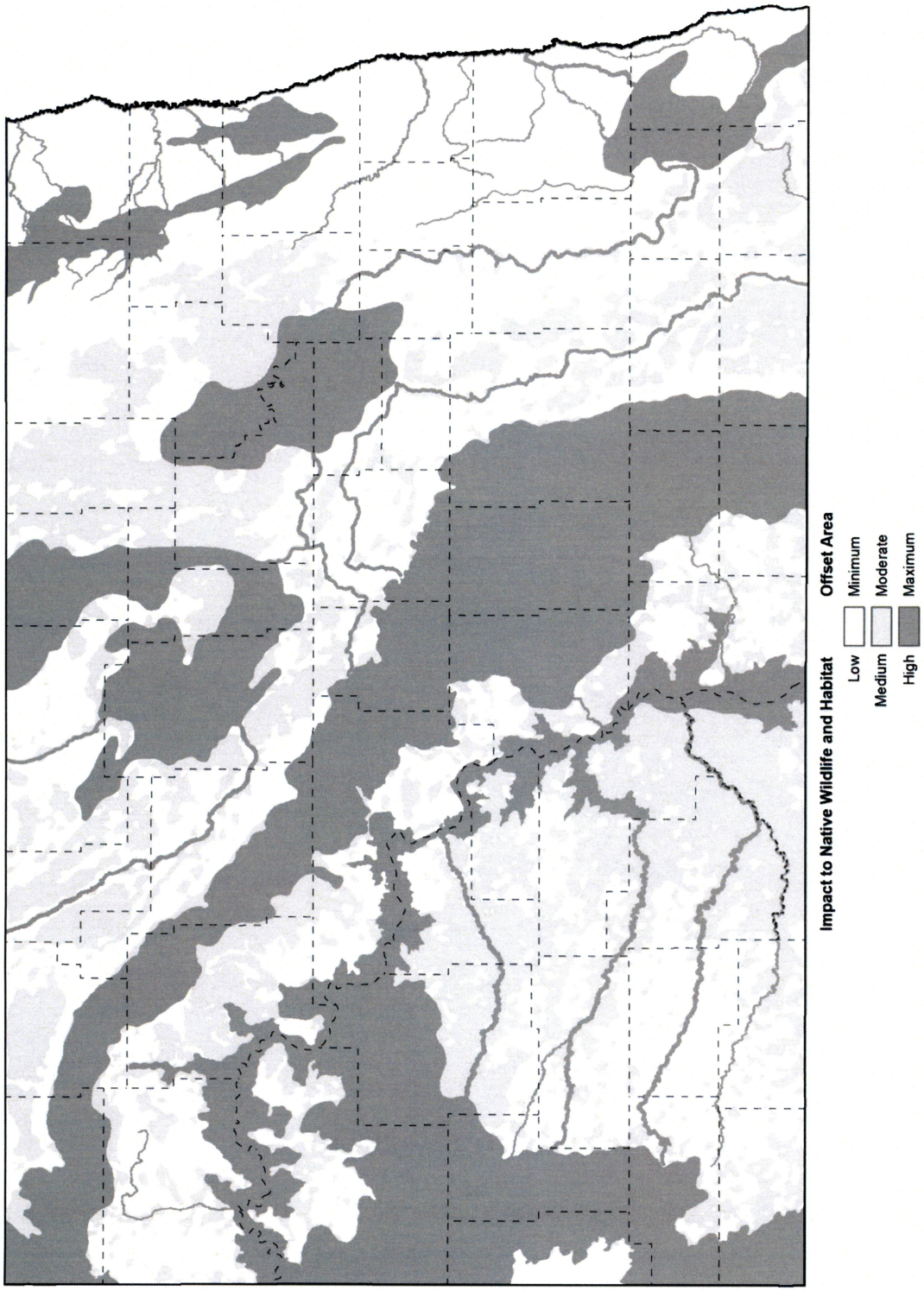

Governor
Doug Burgum

Director
Jeb Williams

Deputy Director
Scott A. Peterson

100 North Bismarck Expressway | Bismarck ND, 58504-5095 | (701) 328-6300 | Fax: (701) 328-6352

**Attachment 5b. Key Native Wildlife and Habitat Areas**



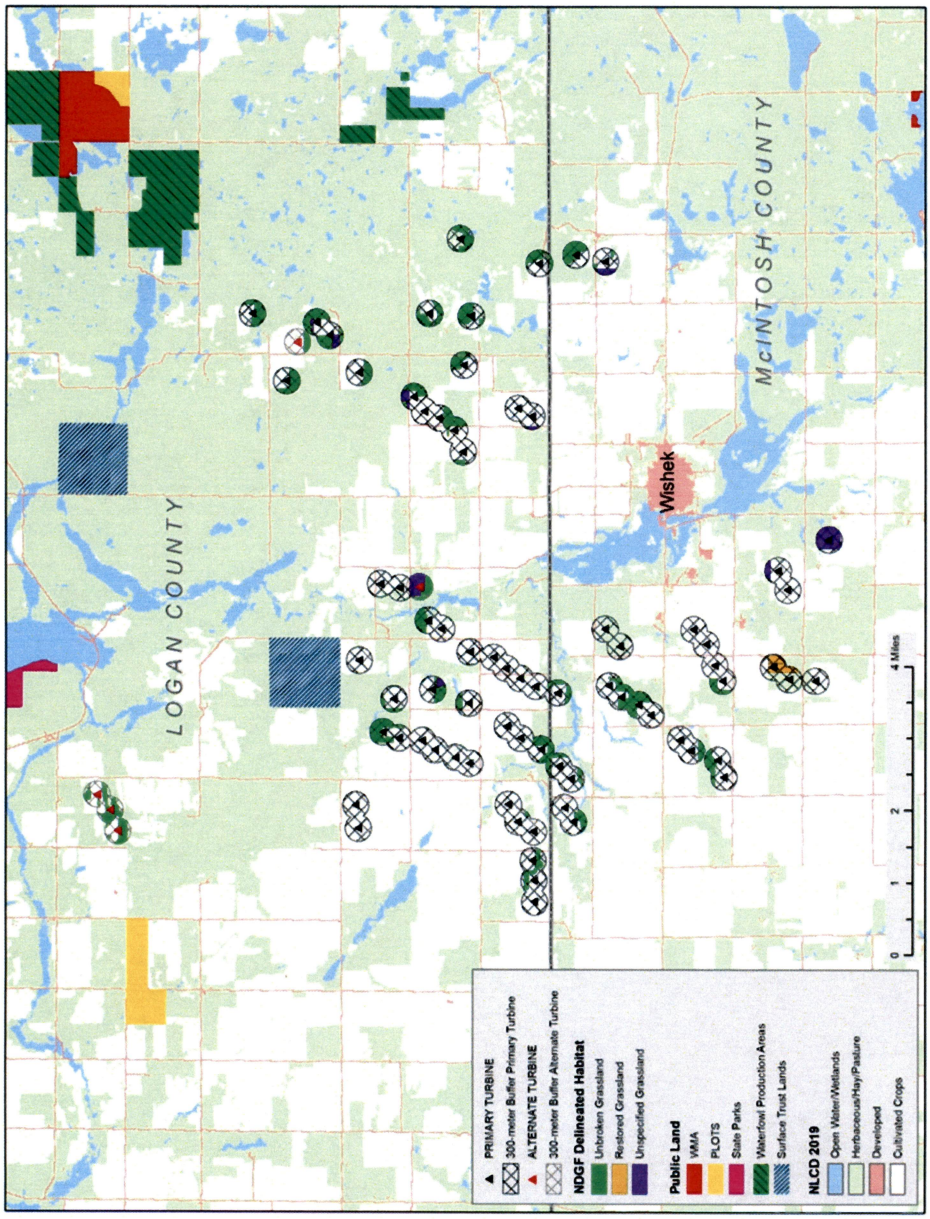

Governor
Doug Burgum

Director
Jeb Williams

Deputy Director
Scott A. Peterson

100 North Bismarck Expressway | Bismarck ND, 58504-5095 | (701) 328-6300 | Fax: (701) 328-6352

**Attachment 6. Final turbine layout and habitat delineation**




Governor
Doug Burgum

Director
Jeb Williams

Deputy Director
Scott A. Peterson

100 North Bismarck Expressway | Bismarck ND, 58504-5095 | (701) 328-6300 | Fax: (701) 328-6352

**Attachment 7. Badger Wind Farm Impacts Analysis and Offset Estimates**

North Dakota Game and Fish Department
February 24, 2022

- Final turbine layout emailed from Sarah Aftergood, Orsetd, to Elisha Mueller, NDGF, on 2/21/2022
- 52 primary turbines, 8 alternate turbines
- Two analyses conducted by NDGF:
  1) NDGF assigned metrics for unbroken grassland
  2) the Avian Impact Offset Method for grassland birds and waterfowl

## NDGF Local Grassland Assessment Desktop Product (using assigned metrics)

- Identified grassland following guidelines in *A Desktop Approach to Avoid and Minimize Development Impacts to Grassland Habitat and Wildlife in North Dakota, May 2021*.
- Created 300-meter dissolved buffer for primary turbines and separate 300-meter dissolved buffer for alternate turbines. Only land within the buffers was examined.
- GIS layers utilized for Local Scale Assessment:
  - NDGF Base Raster Grassland (2008 and 2014 products)
  - NLCD 2019
  - USDA National Cultivated Layer 2020
  - FSA Common Land Units
  - CRP 2008, 2012 and 2019
  - Aerial Imagery 2020, 2019, 2003, 1995/1998, 1957/1962
  - LiDAR Shaded Relief 1m
- 3 types of grassland were delineated:
  1. *Unbroken Grassland* – also referred to as "native prairie." This is grassland that, according to best available spatial information, has not been converted to another land type or land cover (e.g. cropland, developed, roads).
  2. *Restored Grassland* – planted or reconstructed grassland. This typically occurs on previously cultivated land (broken prairie that was then used for crop production for several years). The most common type of restored grassland is CRP but other natural resource agencies operate grassland restoration programs.
  3. *Unspecified or Inconclusive Grassland* – may be unbroken or restored grassland, but spatial layers do not present a definitive answer.
- Results for Primary Turbines
  - **Acres of unbroken grassland impacted = 758.8**
    - **Offset acres = 402.2** (total unbroken X 53% displacement)
  - Additional acres of restored grassland impacted = 43.4 (offset = 23.0 acres)
  - Additional acres of unspecified grassland impacted = 123.5 (offset = 65.5 acres)
  - 1 turbine sited on unbroken grassland
  - 2 additional turbines sited on restored or unspecified grassland
  - 2 additional turbines within 50 feet of grassland

- Results for Alternate Turbines
  - **Acres of unbroken grassland impacted = 113.2**
    - **Offset acres = 60** (total unbroken X 53% displacement)
  - Additional acres of unspecified grassland impact = 39.0 (offset = 20.7)
  - 1 turbine sited on unspecified grassland
  - 2 additional turbines sited within 50 feet of grassland

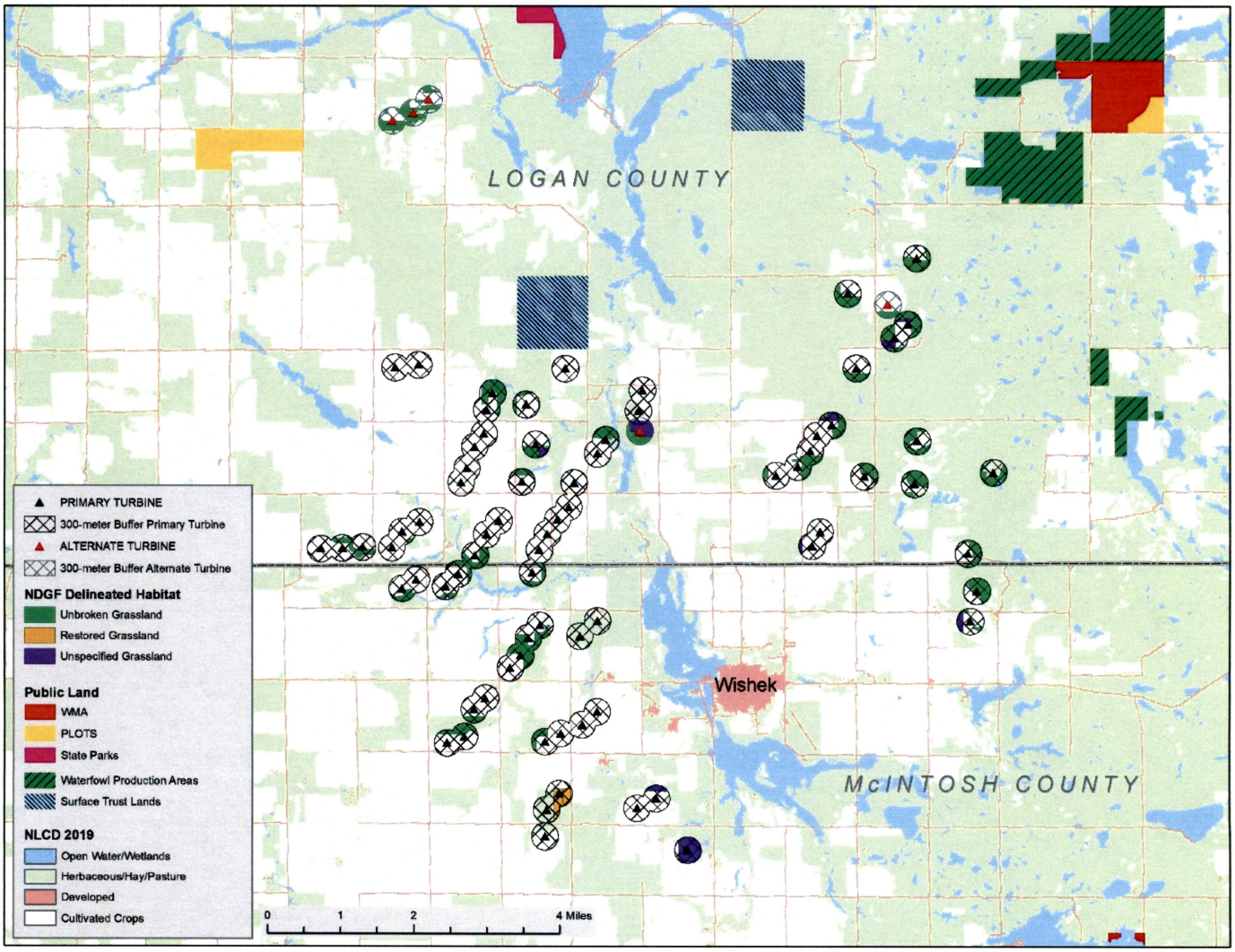



*Figure 1. Results of NDGF local grassland assessment.*


Governor Doug Burgum | Director Jeb Williams | Deputy Director Scott A. Peterson

100 North Bismarck Expressway | Bismarck ND, 58504-5095 | (701) 328-6300 | Fax: (701) 328-6352

# Avian Impact Offset Method (Shaffer et al. 2019)

## Grassland Birds

- This method enables the user to estimate the amount of grassland area needed to offset breeding grassland bird avoidance.
- GIS layers and parameters utilized for Breeding Grassland Birds
    - Primary and alternate turbine locations
    - 300-meter buffer
    - Percent displacement = 53%
    - Type III GBCA (includes all grassland types)
- Results for all turbines:
    - **Acres of grassland impacted = 1,316.2**
        - **Offset acres = 697.6**

## Waterfowl

- This method enables the user to estimate the number of wetland basins needed to offset breeding waterfowl avoidance.
- GIS layers and parameters utilized for Breeding Duck Pairs
    - Primary and alternate turbine locations
    - 804.5-meter buffer
    - Percent displacement = 18%
    - Breeding Duck Pair Abundance
- Results for all turbines:
    - SUM_DuckPairs5Species = 891.2
    - SUM_DuckPairsDisplaced = 160.4
    - MEAN_CountyAveragePairs2_203AcreSeasonalWetland = 4.6
    - **NumOfSeasonalWetalndsToRestore = 35**

**Attachment 8. Impact Analysis done by Western EcoSystems Technology, Inc.**

WEST

ENVIRONMENTAL & STATISTICAL CONSULTANTS

4007 State Street, Suite 109, Bismarck, North Dakota 58503
Phone: 701-250-1756 • www.west-inc.com • Fax: 701-250-1761

# TECHNICAL MEMORANDUM

**Date:** February 10, 2022

**To:** Sarah Aftergood, Orsted Onshore North America LLC

**From:** Martin Piorkowski, Western EcoSystems Technology, Inc.

**Subject:** Badger Wind Farm – Conservation Offset Calculation Summary

## INTRODUCTION

Orsted Onshore North America LLC (Orsted) is developing the Badger Wind Farm (Project) in Logan and McIntosh counties, North Dakota. Orsted requested that Western EcoSystems Technology, Inc. (WEST) develop metrics using the V17 Project layout that Orsted could use in discussion of a potential conservation strategy addressing the voluntary Offset Plan for the proposed Project.

### Direct Impact Calculations

*Temporary Impacts*

Using the proposed Project layout (V17), WEST identified 149.2 ac (60.4 ha) of temporary impacts to unbroken grasslands associated to the Project's infrastructure including access roads, turbine pads, switchyards, etc.). These acres are proposed to be restored back to the condition they were previous to disturbance guided by a Project-specific restoration plan. With these temporary disturbances, no offsets are being considered. If ground disturbing activities (e.g., grading, clearing, etc.) are being conducted during the nesting season (May 15 – July 15), then nest clearing surveys will be completed prior to the disturbance activity.

*Permanent Impacts*

Permanent impacts have been identified across 7.2 acres of unbroken grasslands for the completion and operations of the proposed Project. These acres will be converted from unbroken grasslands to permanent infrastructure, such as access roads or turbine pads. Based on current fair market values in McIntosh and Logan counties, current estimates for grassland protection easements may range between $1,000 and $1,500 per acre. Based on an agency meeting with North Dakota Game and Fish Department (12/8/2021), they recommended a 2:1 replacement of grasslands. Based on the cost for easements and the offset ratios that may be considered, the

result in estimates for the Project could be between $7,200 for a $1,000/acre easement and 1:1 offset ratio, while a $1,500/acre easement at a 2:1 offset ratio may be approximately $21,600.

**Agency Recommended Indirect Grassland Breeding Bird Offset Calculations**

Indirect impacts or displacement to grassland breeding birds were calculated for the proposed V17 turbine layout for the proposed Project. A 300 m (984 ft) buffer was applied to turbines. A total of 631.6 ac (255.6 ha) of field verified unbroken grasslands (Arellano and Piorkowski 2021) were identified (Figure 1). Recent studies (Shaffer and Buhl 2016; Shaffer et al. 2019) indicated a 53% displacement of breeding grassland birds within 300 m of turbines. This 53% displacement equates to 334 ac (135 ha) of grasslands to offset the potential displacement. Current estimates for 30-year land easements range between $1,000 and $1,500 per acre. Estimates for the Project range from $333,591 and $500,386 for grassland breeding bird 1:1 offset calculations for the Project. For a 2:1 offset ratio these estimates could be between $667,182 and $1,000,772.

**Waterfowl Offset Calculations**

Impacts were calculated for indirect impacts to waterfowl using agency recommended Shaffer et al. (2019) along with data from the National Wetland Inventory (NWI) data for the Project (USFWS NWI 2014). An 804.5 m (one-half mile) buffer was applied to all turbine locations to determine the potential impact area (ac; Shaffer et al. 2019) to breeding duck pairs (Figure 2). We used duck pair density estimates from USFWS (2018) and Reynolds et al. (2006), and an 18% displacement effect was applied to the number of breeding duck pairs.

Results from the model estimated 891.2 breeding duck pairs with potential of displacement. At 18% displacement, that resulted in 160.4 breeding duck pairs potentially displaced. The mean county average of breeding duck pairs that are attracted to 2.203 ac seasonal wetland is 4.6 pairs. Using the above calculations it is estimated that 35 of these seasonal wetlands (or 77.1 ac) will need to be restored or created to offset those duck pairs that may have been displaced. The total value at $10,000/acre at a 1:1 offset ratio would be approximately $771,100 and a 2:1 offset ratio would be approximately $1,542,200.

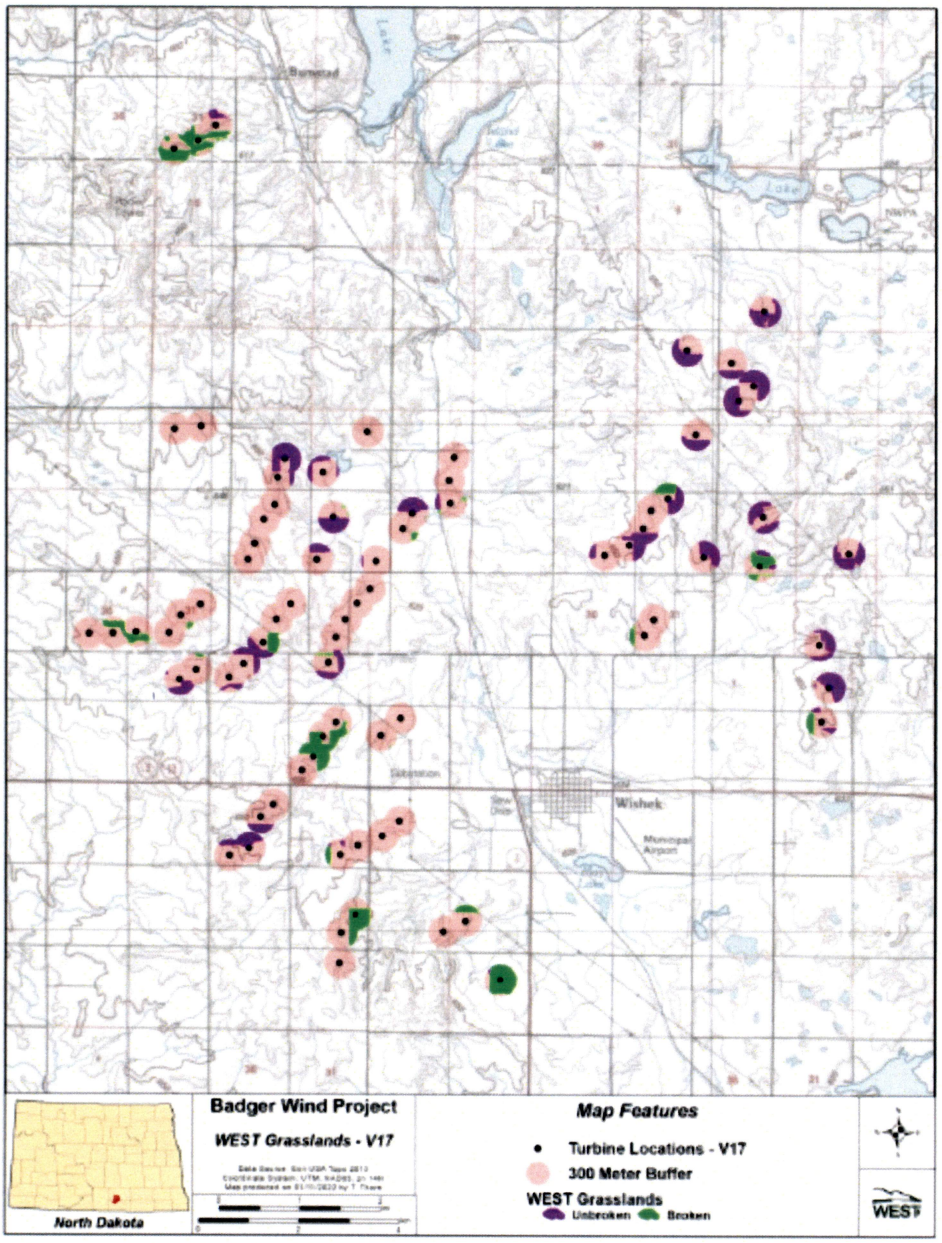



**Figure 1. Field verified grasslands (Broken [green] and Unbroken [purple]) within 300 m (984.2 ft) of proposed turbine locations at the Badger Wind Farm, Logan and McIntosh counties, North Dakota.**


Governor
Doug Burgum

Director
Jeb Williams

Deputy Director
Scott A. Peterson

100 North Bismarck Expressway | Bismarck ND, 58504-5095 | (701) 328-6300 | Fax: (701) 328-6352

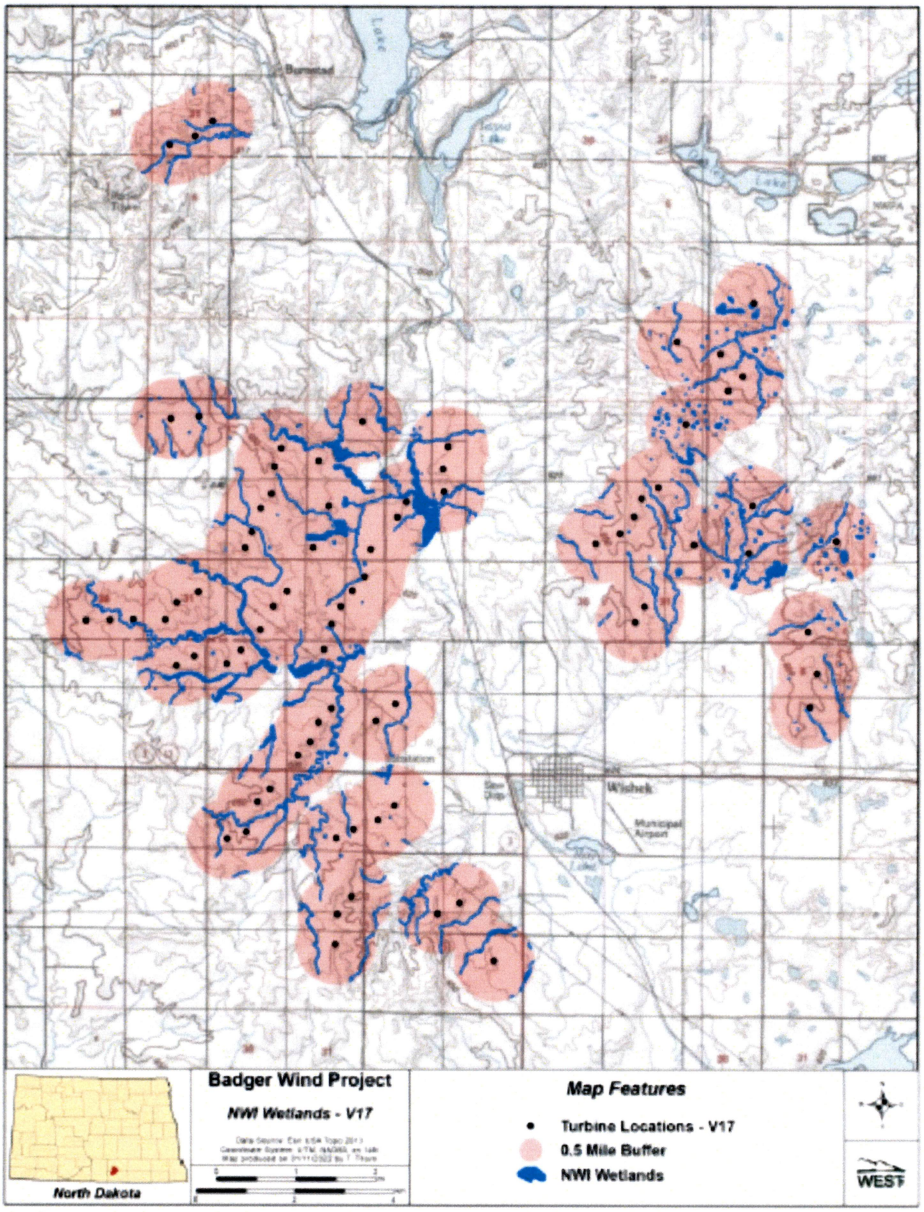



**Figure 2. National Wetland Inventory (NWI) wetlands within 804.5 m (0.50 mi) of proposed turbines at the Badger Wind Farm, Logan and McIntosh counties, North Dakota.**

Governor Doug Burgum | Director Jeb Williams | Deputy Director Scott A. Peterson

100 North Bismarck Expressway | Bismarck ND, 58504-5095 | (701) 328-6300 | Fax: (701) 328-6352

## Attachment 9. Correspondence

**Mueller, Elisha K.**

**From:** Sarah Aftergood <SARAF@orsted.com>
**Sent:** Monday, April 18, 2022 3:07 PM
**To:** Mueller, Elisha K.
**Subject:** RE: Offset guidance
**Attachments:** BAD - Conservation offsets_FinalDraft_(2.10.2022) (005).pdf



Okay great thank you for the documents! Please find a memo I had WEST draft in relation to conservation offsets, it integrates in the field verification data we collected last summer. Let me know your thoughts and I can also get going on the MOU once you are able to send over a version 😊.

Best regards,
Sarah Aftergood
Director of Environmental Permitting
Environmental Permitting
Onshore

Ørsted
Tel. +15122302148

**From:** Mueller, Elisha K. <ekmueller@nd.gov>
**Sent:** Monday, April 18, 2022 2:52 PM
**To:** Sarah Aftergood <SARAF@orsted.com>
**Subject:** Offset guidance

Hi Sarah,

Attached are our offset guidance documents. These have never been finalized so I would appreciate you not sharing them too widely. And just in case it doesn't go without saying, these, like any offsets, are voluntary. These documents incorporate our recommendations based on the best science we have available.

Feel free to reach out if you have any questions!

Elisha Mueller
*Conservation Biologist*

701.328.6348 • ekmueller@nd.gov • gf.nd.gov

NORTH Dakota | Game and Fish
Be Legendary.

**Mueller, Elisha K.**

**From:** Sarah Aftergood <SARAF@orsted.com>
**Sent:** Thursday, April 7, 2022 5:04 PM
**To:** Mueller, Elisha K.
**Cc:** Nicholas Gebauer
**Subject:** Badger Wind Voluntary mitigation



Hi Elisha,

I hope this email finds you well. I'd like to move forward with discussing how we want to approach the voluntary mitigation for the direct and indirect impacts Badger wind will have on grassland and wetland habitats. Let me know how and when we can do this.

Best regards,
**Sarah Aftergood**
Director of Environmental Permitting
Environmental Permitting
Onshore

Tel. +15122302148
saraf@orsted.com

Ørsted

Learn more at us.orsted.com

812 San Antonio St., STE 500
Austin, TX 78701