

Appendix H

Bird and Bat Conservation Strategy



BIRD AND BAT CONSERVATION STRATEGY

BADGER WIND PROJECT LOGAN AND MCINTOSH COUNTIES, NORTH DAKOTA

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Acronyms and Abbreviations

2019 Study Area	the 121,695-acre area in which Badger Wind studies were conducted
ADLS	Aircraft Detection Lighting System
AKN	Avian Knowledge Network
AWP	Aransas/Wood Buffalo Population (whooping cranes)
APLIC	Avian Power-Line Interaction Committee
AWWI	American Wind Wildlife Institute
Badger Wind	Badger Wind, LLC
BBCS	Bird and Bat Conservation Strategy
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
CFR	Code of Federal Regulations
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
DST	Local Siting Decision Support Tool
ECPG	Eagle Conservation Plan Guidance
ESA	Endangered Species Act
EVT	Existing Vegetation Type
FAA	Federal Aviation Administration
GenEst	Generalized Mortality Estimator
IBA	Important Bird Area
IPaC	Information for Planning and Consultation
Kaleidoscope	Kaleidoscope Pro 4.2.0
km	kilometer(s)
kV	kilovolt

LF	LANDFIRE
m	meter
MBTA	Migratory Bird Treaty Act
MET tower	meteorological evaluation tower
MW	megawatt
NDGF	North Dakota Game and Fish
NHD	National Hydrography Dataset
NLEB	northern long-eared bat
NWI	National Wetland Inventory
O&M	Operations and Maintenance
PAD-US	Protected Areas Database of the U.S.
PCMM	post-construction mortality monitoring
PLOTS	Private Lands Open to Sportsmen
Project	Badger Wind Project
Project Area	the 31,514-acre area of the Badger Wind Project
RSZ	rotor-swept zone
SCP	species of conservation priority
SWAP	State Wildlife Action Plan
SPCC	Spill Prevention, Control, and Countermeasure
TES	threatened and endangered species
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WEG	Wind Energy Guidelines
WEST	Western Ecosystems Technology, Inc.
WMA	Wildlife Management Area

WNS	white-nose syndrome
WPA	Waterfowl Production Area
WTG	wind turbine generator

1. INTRODUCTION

This Bird and Bat Conservation Strategy (BBCS) was prepared for the Badger Wind Project (Project) in Logan and McIntosh Counties, North Dakota. The proposed Project is a 256.1-megawatt (MW) wind energy project that will be developed by Badger Wind, LLC (Badger Wind). The project layout comprises 79 potential wind turbine generator (WTG) locations, including 74 primary and 5 alternate locations. The Project Area is located in Red Lake Township and three unorganized townships (T133N R70W, T133N R71W, and T133N R72W) in Logan County, North Dakota, and four unorganized townships (T132N R70W, T132N R71W, T132N R72W, and T131N R72W) in McIntosh County, North Dakota (**Figure 1, Site Location**).

An approximately 0.75-mile-long transmission line will extend east from the central portion of the Project Area (approximately 2.0 miles west-northwest of Wishek, McIntosh County, North Dakota) to the Wishek Junction 230-kilovolt (kV) substation approximately 1.5 miles west of Wishek, McIntosh County, North Dakota (**Figure 1, Site Location**). The proposed route is located entirely within the Badger Wind Project Area (Project Area) and is located in T133N R71W in Logan County, North Dakota and T132N R71W in McIntosh County, North Dakota (**Figure 1, Site Location**).

Badger Wind voluntarily developed this BBCS as part of ongoing efforts to avoid and minimize potential project impacts to avian and bat species. This BBCS covers the development, construction, and operations of the Project.

1.1. Goals and Objectives

The U.S. Fish and Wildlife Service (USFWS) Land-Based Wind Energy Guidelines (WEG) (USFWS 2012) outline a voluntary, structured, tier-based framework that is designed to iteratively evaluate avian and bat concerns at all stages of wind energy development. The USFWS recommends that a wind energy developer “prepare a Bird and Bat Conservation Strategy in stages, over time, as analysis and studies are undertaken for each tier.” As such, this conservation strategy should be viewed as a living document.

In accordance with the WEG, this BBCS documents activities that Badger Wind has completed as part of each tier of the WEG to address potential risks to avian and bat populations and species of concern. Specifically, this BBCS documents steps taken to adhere to federal and state bird and bat conservation and protection laws and regulations; identifies, quantifies, and analyzes potential impacts to birds and bats that may use resources within the Project Area; and outlines measures that will be implemented to reduce potential wildlife impacts resulting from project activities. Sensitive habitat review, species of concern review, and conservation strategies outlined herein were informed by site assessment and by site characterization reviews, desktop and field studies conducted by consultants, and wildlife agency correspondence. Avian surveys and bat acoustic surveys were conducted on an approximately 121,695-acre study area (referenced herein as the “2019 Study Area”) that contains much of the current Project Area. This BBCS is a living document that will remain in effect, and will be updated, as necessary, through the life of the Project.

1.2. Corporate Policy on Wildlife Conservation

Badger Wind has a strong commitment to protecting biodiversity, and its parent company, Ørsted, has set a goal of delivering a net-positive biodiversity impact from all new renewable energy projects it commissions beginning in 2030 at the latest. When developing new projects, Ørsted will systematically implement initiatives that ensure an overall net-positive contribution to natural ecosystems, habitats, and species in and around the company's new renewable energy projects. The core philosophy of the policy is prevention before mitigation wherever possible.

1.3. Regulatory Framework

This BBCS documents efforts by Badger Wind to comply with federal and state regulations including the Endangered Species Act (ESA), Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). North Dakota does not maintain a state-level list of threatened and endangered species. Therefore, only species listed under the ESA are considered threatened or endangered in the state. However, the North Dakota Game and Fish Department (NDGF) does identify Species of Conservation Priority (SCP) within its State Wildlife Action Plan (SWAP); 47 bird species and 7 bat species have been identified. The USFWS specifically recommends that a wind energy developer “may prepare a Bird and Bat Conservation Strategy in stages, over time, as analysis and studies are undertaken for each tier” (USFWS 2012). Measures are incorporated into siting, design, and operation of the project in order to reduce or eliminate the potential for impacts to federal and state endangered and threatened species and bird and bat species of concern. These measures are described in this BBCS.

1.3.1. Endangered Species Act

The ESA of 1973 authorizes the USFWS (while working cooperatively with states) to identify, list, and monitor qualifying species as endangered and threatened. The process by which potential candidates are listed is determined by the vulnerability of the species population and considers a number of different factors. Species that are designated as either endangered or threatened are afforded protection from possession, sale, transport, and take. The definition of take is “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” including “incidental take” or significant habitat modification. Take, however, can be permitted by the USFWS through the ESA Section 7 consultation process among federal agencies or by individual permit under ESA Section 10(a)(1)(B) and an accompanying habitat conservation plan.

The USFWS is responsible for the protection and management of ESA-listed species, as protected under federal law. The USFWS Information for Planning and Consultation (IPaC) is an online resource that allows users to quickly search a comprehensive geo-referenced database to help assess the potential for ESA-listed endangered and threatened species (TES) to occur in an area (USFWS 2021a). The USFWS also has created a list of bird species that have the potential to become listed in the future without additional conservation actions (USFWS 2021b). Information on these species, referred to as Birds of Conservation Concern (BCC), is also included in IPaC reports. BCC species are not afforded any additional regulatory protection under the ESA.

1.3.2. Bald and Golden Eagle Protection Act

Under authority of BGEPA, 16 U.S. Code (USC) 668–668d, bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are afforded legal protections in addition to the MBTA. BGEPA prohibits the take, sale, purchase, barter, offer of sale, transport, export, or import, at any time or in any manner of any bald or golden eagle, alive or dead, or any part, nest, or egg thereof. In 16 USC 668c, the BGEPA also expands the common law scope of “take” to include “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb,” and includes criminal and civil penalties for violating the statute (see 16 USC 668). The USFWS further defined the term “disturb” as agitating or bothering an eagle to a degree that causes, or is likely to cause, injury, a decrease in productivity, or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior.

If eagles are identified as a potential risk at a project site, wind energy developers are encouraged by the USFWS to follow the Eagle Conservation Plan Guidance (ECPG) (USFWS 2013). The ECPG describes recommended actions to develop wind energy projects while protecting eagles, including guidance for applicants seeking to obtain the above permits.

1.3.3. Migratory Bird Treaty Act

The MBTA integrates and implements four international treaties that provide for the protection of migratory birds against hunters and poachers. The MBTA prohibits the taking, killing, possession, transportation, import, and export of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior” (16 USC § 703; 1918). The word “take” is defined by regulation as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect” (50 Code of Federal Regulations [CFR] § 10.12; 1973). The USFWS maintains a list of all species protected by the MBTA at 50 CFR § 10.13 (1973). This list includes over one thousand species of migratory birds, including eagles and other raptors, waterfowl, shorebirds, seabirds, wading birds, and passerines. There currently is no permit available from the USFWS that authorizes take of migratory birds protected under the MBTA. However, the USFWS is currently evaluating proposed rulemaking that would include regulations that would authorize incidental take of migratory birds under certain prescribed conditions.

1.3.4. North Dakota Century Code Chapter 20.1-04

In accordance with North Dakota Century Code Chapter 20.1-04, no person, without a permit, “shall kill, catch, take, ship, cause to be shipped, purchase, offer, or expose for sale, sell, or have in that person’s possession or under that person’s control, any harmless wild bird, or any part thereof”. Harmless wild birds are defined as all wild birds except blackbirds, magpies, English sparrows, and starlings. Similarly, “no person may hunt, take, kill, possess, convey, ship, or cause to be shipped, by common or private carrier, sell, or barter any game bird or any part thereof...except as provided by this title”. Game birds include all varieties of geese, brant, swans, ducks, plovers, snipes, woodcocks, grouse, sagehens, pheasants, Hungarian partridges, quails, partridges, cranes, rails, coots, wild turkeys, mourning doves, and crows.

1.3.5. North Dakota's State Wildlife Action Plan

The 2015 North Dakota SWAP is the principal document for safeguarding rare and declining species of fish and wildlife within the state (Dyke et al. 2015). The SWAP places an emphasis on the protection of diverse native habitats to maximize the preservation of native wildlife diversity. In addition, the SWAP denoted 115 species that are assigned to one of three conservation priority levels based on their risk level and the species-specific sources and availability of conservation funding. The SWAP defines SCP conservation levels as follows (Dyke et al. 2015):

Level I species are those having a high level of conservation priority because of declining status in North Dakota or across their range; or have a high rate of occurrence in North Dakota, constituting the core of the species breeding range, but may be at risk range wide.

Level II species are those having a moderate level of conservation priority; or a high level of conservation priority but a substantial level of non-state wildlife grant funding is available to them.

Level III species are those having a moderate level of conservation priority but are believed to be peripheral or non-breeding in North Dakota.

The statewide list includes 47 birds, 2 amphibians, 9 reptiles, 21 mammals, 22 fish, 10 freshwater mussels, and 4 insects (Dyke et al. 2015).

It is understood that the SWAP has no regulatory authority over industrial development on private land. Conservation actions in the SWAP for such development include goals to foster/develop entities to administer conservation easements and to urge ecologically responsible ordinances and suitable reclamation standards. Should project development impact SCP on private land, the SWAP will be consulted for possible mitigation actions to reduce or minimize those impacts.

1.3.6. Agency Coordination

Badger Wind has coordinated with the USFWS and NDGF during development of the Project. Periodic coordination with the wildlife agencies has continued, particularly through the process of assessing and analyzing bird and bat data collected, throughout the development of the Project. Coordination has included emails, conference calls, and meetings to discuss study plans and preliminary results from studies, as well as to request data from the agencies. Badger Wind has also requested that USFWS and NDGF provide recommendations to minimize potential impacts to species of concern for consideration by Badger Wind. **Table 1** includes a timeline of communications and coordination with federal and state wildlife agencies. Badger Wind intends to continue to coordinate with USFWS and NDGF during the development and implementation of this BBSCS.

Table 1. Summary of Agency Correspondence

Date	Parties Involved	Correspondence Type	Correspondence Content
January 10, 2020	USFWS: Michael Erickson Atwell: Chris McCreedy	Email	Request for grassland and wetlands easements data.
January 14, 2020	USFWS: Michael Erickson Atwell: Chris McCreedy	Email	Response to request for grassland and wetlands easements data.
January 21, 2020	USFWS: Michael Erickson Atwell: Chris McCreedy	Email	Answers to follow-up questions, including how to get shapefile and KMZ spatial data of easements.
January 28, 2020	USFWS: Drew Becker, Heidi Riddle NDGF: Steve Dyke, Elisha Mueller, Sandra Johnson, Kevin Kading, Renae Schultz Ørsted: Jon Baker Atwell: Emily Cooper, Chris McCreedy	Meeting	Agency project introduction meeting—including summary of studies completed to date.
February 12–18, 2020	NDGF: Sandra Johnson Atwell: Chris McCreedy	Email	Request to discuss available data layers NDGF has developed to inform analysis for the Project and to establish a data-sharing agreement. S. Johnson requested shapefiles of the latest project boundary. C. McCreedy sent the shapefiles and set up a follow-up meeting to discuss the shapefiles.
February 25–27, 2020	NDGF: Sandra Johnson Atwell: Chris McCreedy	Email	S. Johnson provided the data-sharing agreement, along with data for sharp-tailed grouse, native grassland, whooping crane, and bald eagle nests, as well as manuscripts to inform impact assessment and recommendations for offsets. C. McCreedy responded confirming the one bald eagle nest in the Project Area was the one Atwell identified. C. McCreedy also provided coordinates for that nest, as well as four ferruginous hawk nest locations.

Date	Parties Involved	Correspondence Type	Correspondence Content
February 25–26, 2020	USFWS: Heidi Riddle, NDGF: Elisha Mueller, Kevin Kading, Renae Schultz Ørsted: Jon Baker Atwell: Emily Cooper, Chris McCreedy	Email	C. McCreedy requested final comments on the draft minutes from the January 28 meeting. E. Mueller recommended that developers perform lek surveys and requested that the meeting minutes reflect that recommendation.
March 11–20, 2020	NDGF: Elisha Mueller, Sandra Johnson Atwell: Chris McCreedy	Email	C. McCreedy inquired about the availability of the grassland habitat tool. E. Mueller confirmed NDGF had just received that data and will follow up when they determine how they may be able to share it. In another follow-up, E. Mueller indicated there was a delay due to staff working remotely, but Sandra would be in touch when the data can be shared.
March 12, 2020	NDGF: Sandra Johnson Atwell: Chris McCreedy	Email	Follow-up response to agency meeting requesting to create a data-sharing agreement with the agency to obtain North Dakota grassland habitat decision support tool.
April 3, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller Atwell: Emily Cooper, Chris McCreedy	Meeting	Agency meeting regarding aerial survey safety precautions. Given (a) health concerns regarding the COVID-19 virus and (b) safety concerns stemming from recent incidents during nesting raptor surveys at wind facilities in nearby states. Atwell inquired whether a hybrid aerial survey and ground-based survey approach could meet the goals and expectations for year 2 pre-construction raptor nest and lek surveys. USFWS and NDGF indicated their acceptance of a hybrid survey approach, with a scaled-back aerial survey focusing on areas within the 2019 Study Area that lack roads and cannot be easily accessed during ground-based survey.
April 22, 2020	USFWS: Heidi Riddle Atwell: Chris McCreedy	Phone Call	Discussion of whooping crane sightings near Wishek.

Date	Parties Involved	Correspondence Type	Correspondence Content
May 15, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller Atwell: Aaron McAlexander	Email	Provided draft bat habitat assessment and year 1 acoustic monitoring results for review and comment. Recommendation is that summer potential for northern long-eared bats may be limited within the Project Area. Requested input on whether the Project should be concerned with impacts to bats, particularly northern long-eared bats, and whether the agencies feel summer presence/probable absence (p/a) surveys (in accordance with the 2020 Range-Wide Indiana Bat Survey Guidelines) are warranted.
May 22, 2020	USFWS: Heidi Riddle Atwell: Aaron McAlexander	Email	Follow-up to May 15, 2021, email.
May 27, 2020	USFWS: Heidi Riddle, Michael Erickson Ørsted: Jon Baker Atwell: Emily Cooper, Tara Corbett	Meeting	Discussion of USFWS wetland easements in Badger Project Area.
October 28, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller Atwell: Chris McCreedy	Email	Submitted initial Grasslands Report to agency. Request to schedule meeting to provide update on Project and discuss findings for avian studies and grassland assessment.
October 28, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller, Sandra Johnson, Steve Dyke, Greg Link Atwell: Chris McCreedy	Email	Response to receipt of report and how the contents relate to regulatory guidance and prior January 28, 2020 meeting.

Date	Parties Involved	Correspondence Type	Correspondence Content
October 30, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller, Sandra Johnson, Steve Dyke, Greg Link Atwell: Chris McCreedy, Maureen O'Shea-Stone	Email (2)	<p>1) NDGF response to grassland assessment, noting specific definition of unbroken grasslands are grasslands that have not been plowed. Presence of haying, grazing, or undesirable species do not indicate disturbance. NDGF noted they... <i>“are discouraging efforts to try to classify “high quality” or “native” grassland as not worthwhile, and are focusing instead on the unbroken classification as the conservation priority.”</i></p> <p>2) NDGF provided contact information for Chuck Loesch, USFWS HAPET and recommendation he would be best contact for moving forward with a wetland/waterfowl impact analysis using the Local Siting Decision Support Tool (DST).</p>
October 30, 2020	NDGF: Elisha Mueller Atwell: Maureen O'Shea-Stone, Chris McCreedy	Meeting	Phone meeting to discuss E. Mueller’s comments on the draft grassland report. E. Mueller provided contact information (Chuck Loesch, USFWS HAPET) for moving forward with wetland/waterfowl impact analysis; C. Loesch should be able to provide the Local Siting DST.
November 2–6, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller, Steve Dyke, Greg Link, Sandra Johnson Atwell: Tara Corbett, Chris McCreedy, Maureen O'Shea-Stone, Emily Cooper,	Email	E. Mueller responded to M. O’Shea-Stone’s email with some edits to her list of understanding points/action items and then asked S. Johnson to add anything she missed. S. Johnson responded and said that she will send the base raster layer for native prairie (unbroken grassland) and attached an email she sent C. McCreedy in February 2020. Revisions to notes re: understanding points and action items were finalized based on E. Mueller’s requests.
November 6, 2020	USFWS: Heidi Riddle NDGF: Elisha Mueller, Sandra Johnson, Steve Dyke, Greg Link Atwell: Chris McCreedy, Tara Corbett, Maureen O'Shea-Stone	Email	Response to November 2, 2020, email from E. Mueller. Email outlines list of further understanding points from conversations and action items to complete to address issue.

Date	Parties Involved	Correspondence Type	Correspondence Content
December 8, 2020	USFWS: Heidi Riddle, Drew Becker NDGF: Elisha Mueller, Sandra Johnson, Steve Dyke, Greg Link Ørsted: Sam Lodge, Jon Baker, Nick Lindsey Atwell: Chris McCreedy, Tara Corbett, Maureen O'Shea-Stone	Meeting	Meeting to provide a project update and grassland discussion.
January 15, 2021	NDGF: Elisha Mueller Atwell: Maureen O'Shea-Stone	Phone Call	Discussion of native grassland impacts and voluntary offsets.
January 19, 2021	NDGF: Elisha Mueller Atwell: Maureen O'Shea-Stone	Email	Draft guidance regarding wetland and grassland mitigation.
February 2, 2021	USFWS: Heidi Riddle Atwell: Chris McCreedy	Email	USFWS response to Project, including recommended guidance and required compliance for development of Badger Wind Project.
May 20–25, 2021	USFWS: Heidi Riddle NDGF: Sandra Johnson, Elisha Mueller Atwell: Chris McCreedy	Email	Guidance regarding raptor nest buffers and removal.
August 9, 2021	USFWS: Heidi Riddle NDGF: Elisha Mueller Ørsted: Charlie Smith, Francesca Martella, Sarah Aftergood Atwell: Maureen O'Shea-Stone, Tara Corbett, Chris McCreedy	Meeting	Project update meeting.

Date	Parties Involved	Correspondence Type	Correspondence Content
September 1, 2021	USFWS: Heidi Riddle NDGF: Elisha Mueller Ørsted: Francesca Martella, Charlie Smith, June Marie Gray, Sarah Aftergood Atwell: Christopher Rutledge, Maureen O'Shea-Stone	Phone Call	Informal project update meeting.
September 20, 2021	USFWS: Heidi Riddle NDGF: Elisha Mueller Ørsted: Francesca Martella, Claire Dittrich, Sarah Aftergood WEST: Kurt Smith, Martin Piorkowski Atwell: Christopher Rutledge, Maureen O'Shea-Stone, Tanya Johnson	Meeting	Meeting to discuss grassland assessment, avian species impact analysis, and sharp-tailed grouse leks.
December 8, 2021	USFWS: Heidi Riddle NDGF: Elisha Mueller Ørsted: Francesca Martella, June Marie Grey, Lucas Buseck, Sarah Aftergood WEST: Kurt Smith, Martin Piorkowski Atwell: Christopher Rutledge, Tanya Johnson, Caitlin Cyrus, Alan Plumeau Frederickson: Mollie Smith, Bridget Duffus	Meeting	Project update meeting. Ørsted presented the preliminary project layouts, working through how they have been sited to address USFWS and NDGF concerns. Western Ecosystems Technology, Inc. (WEST) presented results of year 2 grassland habitat surveys and sharp-tailed grouse lek surveys. The remainder of the meeting focused on discussions relating to how to address impacts and potential mitigation measures. The USFWS and NDGF pointed Ørsted toward the Shaffer and Loesch models for calculating offsets to grassland birds and waterfowl.

2. PROJECT AND SITE DESCRIPTION

The current Project Area (as of February 10, 2022) spans approximately 31,514 acres within Red Lake Township and three unorganized townships (T133N R70W, T133N R71W, and T133N R72W) in Logan County, North Dakota, and four unorganized townships (T132N R70W, T132N R71W, T132N R72W, and T131N R72W) in McIntosh County, North Dakota (**Figure 1, Site Location**). Project components include 74 primary and 5 alternate WTG locations.

An approximately 0.75-mile-long transmission line will extend south from the central portion of the Project Area (approximately 2.0 miles west-northwest of Wishek, McIntosh County, North Dakota) to the Wishek Junction 230-kV substation approximately 1.5 miles west of Wishek, McIntosh County, North Dakota. The proposed route travels through T133N R71W in Logan County, North Dakota, and T132N R71W in McIntosh County, North Dakota (**Figure 1, Site Location**).

Project infrastructure would include approximately 30.3 miles of permanent access roads, an underground electric collection line system totaling approximately 75.0 miles, temporary laydown/staging areas totaling approximately 90.2 acres, approximately 2.1 acres for the proposed electric substation. In addition, a haul route with multiple temporary road intersection improvements and temporary disturbance from construction crane paths will be required for construction of the Project. WTGs and permanent infrastructure for the project layout have been sited to reduce the potential for impacts to sensitive wildlife and habitat to the maximum extent feasible. Total permanent impacts from all project infrastructure will comprise approximately 92.3 acres (approximately 0.3 percent of the Project Area), and temporary construction impacts will account for approximately 1,361.4 acres (approximately 4.3 percent of the Project Area).

The Project Area is predominately within the Missouri Coteau Slope Level IV Ecoregion, with portions of the eastern boundary extending upward into the Missouri Coteau Level IV Ecoregion (Bryce et al. 1996). The Level IV Ecoregions are located within the Northwestern Glaciated Plains Level III Ecoregion. Soils in the ecoregion consist of mollisols and some entisols. The region was once dominated by prairie grasses (spear, grama, and wheat grasses) and shrubs. Forested area consisting of scrubby aspen, box elder, cottonwood, and willow is limited to shaded slopes in the valleys and river terraces (EPA 2002). The Missouri Coteau is an escarpment of glacial till containing numerous hills, small lakes, and poorly drained depressions that are referred to as “potholes” that receive most of their water from snow melt and precipitation (Bryce et al. 1996). The Missouri Coteau Slope descends westward toward the Missouri River from the Coteau and is characterized by a thinner glacial till layer and integrated drainages that flow toward the Missouri River (Clayton 1962).

Existing vegetation within the Project Area is summarized using LANDFIRE’s (LF) Existing Vegetation Type (EVT) dataset (USGS 2020a). According to the LF dataset, cropland represents the greatest portion, approximately 39.3 percent, of land cover within the Project Area. In addition, pasture/hayland comprises approximately 6.3 percent of cover within the Project Area. Mixed-grass prairie, planted grassland, and riparian herbaceous cover types encompass approximately 29.2 percent, 14.7 percent, and 6.7 percent of the Project Area, respectively (**Figure 2, Land Cover**).

Types within the Project Area). Developed roadways comprise approximately 2.5 of land cover within the Project Area. The remaining approximately 1.3 percent of land cover within the Project Area includes planted woodland (0.4 percent), planted herbaceous (0.3 percent), prairie pothole (0.3 percent), open water (0.1 percent), and wooded draw/ravine woodland (0.1 percent) cover types. Shrubland, riparian woodland, badlands, herbaceous wetland, and tallgrass prairie cover types each represent less than 0.1 percent of cover within the Project Area (USGS 2020a). According to the U.S. Geological Survey (USGS) Protected Areas Database of the U.S. (PAD-US), protected lands within the Project Area consist several USFWS grassland and wetland easements, as well as one state-owned land parcel. Additional USFWS easements and state-owned lands (including state wildlife management areas) are located within one mile of the Project Area (**Figure 3, Public Lands**) (USGS 2020b).

Analysis of aerial imagery, the USGS National Hydrography Dataset (NHD), and USFWS National Wetland Inventory (NWI) databases confirms that scattered woodlots, tree lines, riparian corridors, and mapped surface water features (i.e., streams) and/or wetlands exist within the Project Area. According to the USGS NHD and USFWS NWI, the Project Area contains approximately 127.0 miles of NHD watercourses, 219.4 acres (approximately 0.7 percent of the Project Area) of NHD waterbodies (USGS 2020c), and approximately 1,372.8 acres (approximately 4.4 percent of the Project Area) of NWI wetlands (USFWS 2020a) (**Figure 4, Water Resources**).

A review of NWI data indicates that there are approximately 1,147.9 acres (approximately 3.6 percent of the total Project Area) of emergent wetlands and freshwater ponds within the Project Area. Additionally, forested/scrub-shrub wetlands account for approximately 0.8 acres (less than 0.1 percent of the Project Area), and riverine features account for approximately 224.1 acres (approximately 0.7 percent) of the Project Area (USFWS 2021c). NWI wetlands are scattered throughout the Project Area and appear to be concentrated along stream corridors. According to the LF dataset, the prairie pothole cover type encompasses approximately 100.8 acres (0.3 percent) of the Project Area (USGS 2020a). Prairie potholes are depressional freshwater wetlands found mostly in the upper Midwest. The prairie pothole region is a complex system of wetlands and surrounding grasslands that serves as crucial habitat for waterfowl, grassland species, and migratory birds. However, more than half of the region has been converted to cropland. The northeastern portion of the Project Area appears to have the relatively highest concentration of prairie pothole features with associated emergent wetlands.

Filter strips (also referred to as buffer strips) are common within agricultural areas in this region. Filter strips are vegetated areas similar to pastures and grasslands. These areas serve as buffers to protect surface water from agricultural runoff and provide potential habitat for wildlife.

The Project Area is located in the Prairie Pothole Bird Conservation Region (BCR) (NABCI 2021). BCRs are ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues. The prairie potholes region stretches from the prairie provinces in Canada into northern Montana, the Dakotas, western Minnesota, and northern Iowa and is an area characterized by mixed-grass and tallgrass prairie marked by thousands of shallow wetlands (i.e., potholes). This region is important to North American waterfowl production, despite years of extensive wetland drainage and agricultural conversion. Dabbling and diving duck densities, in

addition to upland nesting shorebird species, can be notably high in this region of North Dakota. Important habitat for dozens of other nesting and migrant conservation priority species is present throughout the region (Fitzgerald et al. 1999). Based on USFWS waterfowl nesting density data provided to Atwell in 2017 by the NDGF, the Project Area is located primarily within a region that supports approximately 40 pairs of waterfowl or less per square mile. This is relatively low compared to much of the region to the north and east of the Project Area, which supports more than 100 pairs of waterfowl per square mile (NABCI 2021). The overall landscape within the Project Area is highly fragmented, consisting of approximately 45.6 percent cultivated crops and hay/pasture (USGS 2020a), consistent with the described modern use of this BCR. According to USFWS, 34 species are considered BCC for the U.S. portion of the Prairie Pothole BCR, eight of which do not breed within the BCR (USFWS 2021b).

3. DESCRIPTION OF WEG TIERED APPROACH

In March 2012, the USFWS released the final WEG, which uses a tiered approach as an interactive decision-making process. This tier process collects information in increasing detail to identify avian and bat species of concern to determine how a proposed development may impact such species, both directly and indirectly (USFWS 2012). This section provides an overview of the tiered approach outlined in the WEG.

Tier 1 of the WEG is a preliminary site evaluation on a broad geographical scale that is undertaken to understand which species of concern may be present, what critical habitat may exist, and whether areas of wildlife concentration are present. Tier 2 typically consists of the same review but on a site-level scale. For Tier 2, the proposed development footprint within site boundaries is evaluated relative to the potential for species of concern to occupy the site, and potential impacts to those species are assessed. The specific objectives of the Tier 1 and Tier 2 evaluations as they pertain to the Project include the following:

- Tier 1—Preliminary Site Evaluation
 - Identify species of concern and/or their habitats in the region surrounding the proposed project.
 - Identify critical habitats, areas of conservation concern, and state/local habitat areas that could harbor or concentrate species of known conservation concern in the region surrounding the proposed project.
 - Review known areas of wildlife concentration, large habitat patches, and known movement corridors in the region surrounding the proposed project.
- Tier 2—Site Characterization
 - Conduct the same analysis as Tier 1, but on a more refined site-specific scale.
 - Review which species of birds and bats are known to be at risk from wind energy development and operation and are likely to use or move through the site.
 - Assess potential impacts to species of concern.

During Tier 3, field studies are conducted to determine the use of the site by avian and bat species, including species of concern. Information gathered from Tier 3 studies is used to evaluate potential risks to birds and bats and to inform the project design to avoid or minimize significant impacts to species and habitats. The specific objectives of the Tier 3 evaluations are summarized as follows:

- Tier 3—Wildlife Field Studies and Impact Prediction
 - Evaluate potential risks to bird and bat species.

- Design and conduct wildlife surveys/studies to determine use of the site by species of concern.
- Use study results to inform project design to avoid and/or minimize significant adverse impacts, identify potential mitigation measures, and determine level of effort needed for post-construction studies.

For the Tier 4 evaluation, potential impacts are evaluated through post-construction mortality studies. If additional information is needed, other post-construction studies or a more formalized research program may be deemed necessary, and these studies may be implemented as part of a Tier 5 process. The specific objectives of the Tier 4 and 5 evaluations include the following:

- Tier 4—Post-construction Studies to Estimate Impacts
 - Conduct fatality studies to assess whether predictions of fatality risk and direct and indirect impacts were correct.
 - Compare fatality rates within the Project Area, and among other nearby projects, relative to bird and bat use of the Project Area.
 - Assess direct and indirect impacts of habitat loss, degradation, and fragmentation.
- Tier 5—Other Post-Construction Studies and Research
 - Implement additional post-construction studies or research only if additional information is needed.

Tier 4 studies will be undertaken after the completion of project construction and in accordance with the post-construction monitoring program. The results of these studies may be used to inform updates to this BBCS, as appropriate.

At the conclusion of each tiered analysis, a series of decision points are evaluated prior to moving to the next tier. Decisions are based on the information obtained from answering a series of questions in each tier. Part of the decision process for each tier is an evaluation of risk. Estimates of risk will typically be qualitative but may be based on quantitative information.

The BBCS summarizes the results of/answers to questions posed in each tier of the WEG. The BBCS document serves as the primary synthesis of information gathered during the tiered siting process, details each specific question for each WEG tier, provides a response to that question, and ultimately addresses how this information was used to avoid and reduce potential impacts to birds and bats.

4. TIERS 1 AND 2—PRELIMINARY SITE EVALUATION AND SITE CHARACTERIZATION

A preliminary site evaluation was conducted to review habitat characteristics and historic bird and bat occurrence data at a regional level. As part of this evaluation, a Tier 1 analysis was completed to assess the likelihood of federal and state species to occur within the general vicinity of the Project Area (the 2019 Study Area). For the purposes of this document, the 2019 Study Area consists of an initial (April 2019) project boundary that was considered for development of the Badger Wind Project and described in the Critical Issues Analysis for the Badger Wind Project (Atwell 2019). An IPaC analysis was performed for the 2019 Study Area and a 1-mile buffer in July 2019 (**Appendix A**) (USFWS 2019a). **Figure 5, Site Evaluation** shows the 2019 Study Area boundary drawn at a scale that includes a 10-mile buffer around the 2019 Study Area to provide regional context regarding potential resources relevant to birds and bats in the surrounding area.

Following the preliminary site evaluation, Tier 2 studies were conducted for the Project, including a desktop bat habitat characterization (with site visit), desktop whooping crane (*Grus americana*) stopover habitat assessment, and a desktop grassland assessment (with site visit). The bat habitat assessment was conducted for the 2019 Study Area, but the whooping crane stopover habitat assessment was conducted for a December 2020 Project Area boundary that is similar to (though slightly larger than) the current Project Area. The desktop grassland assessment was conducted for a preliminary site layout within the current Project Area boundary. The current Project Area boundary is a significant reduction in size from the 2019 Study Area; however, this smaller boundary is almost entirely within the larger 2019 Study Area boundary. Approximately 96.7 percent of the current Project Area boundary is within the 2019 Study Area boundary. Therefore, results from the studies discussed hereafter are representative of the current Project Area.

Publicly available information that was reviewed as part of Tier 1 and Tier 2 analyses included, but was not limited to:

- USGS 7.5-minute quadrangle maps
- USGS PAD-US
- USGS NHD
- USGS National Land Cover Database
- USFWS NWI data
- USFWS Critical Habitat Portal
- USFWS IPaC tool
- USFWS and NDGF websites (including species profiles)
- North Dakota SWAP

Data that were utilized for the preliminary site evaluation were compiled into a site evaluation map (**Figure 5, Site Evaluation**) that was subsequently used to inform site characterization (Tier 2), baseline avian and bat studies (Tier 3), project planning and site layout and design, and project infrastructure micrositing.

4.1. Question 1 and Response

Are known species of concern present on the proposed site, or is habitat (including designated critical habitat) present for these species?

Tier 1 and 2 analyses indicated that the 2019 Study Area is within the range of 21 species of concern, including four ESA-listed threatened or endangered species and species listed as SCP per North Dakota's SWAP. ESA-listed species identified as having the potential to occur within the 2019 Study Area include northern long-eared bat (*Myotis septentrionalis*), whooping crane, piping plover (*Charadrius melodus*), and red knot (*Calidris canutus rufa*) (**Table 2**). Bald and golden eagles, which are protected under BGEPA, were also identified during Tier 1 and 2 analyses as being likely to occur within the 2019 Study Area (**Table 2**). Threatened and endangered species listed under the ESA and eagle species listed under the BGEPA are discussed below.

Table 2. Bird and Bat Species of Concern with Potential to Occur in the 2019 Study Area

Common Name (Scientific Name)	Federal Status ^a	State Status ^b	Habitat Requirements ^c	Likelihood of Occurrence ^d
BIRDS				
Whooping Crane (<i>Grus americana</i>)	FE	SCP III	Inhabits open habitats such as grasslands, marshes, and agricultural fields. Nest selection varies from natural cavities to fabricated structures.	Moderate
Piping Plover (<i>Charadrius melodus</i>)	FT	SCP II	Alkali lakes, freshwater lakes, reservoirs, and rivers.	Unknown
Red Knot (<i>Calidris canutus rufa</i>)	FT	SCP III	Natural wetland features such as freshwater lakeshores and alkali lakes for migration stopover habitat.	Unknown
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	BGEPA; BCC ^e	SCP II	Inhabits isolated and undisturbed areas near large waterbodies. Nests in forest stands with large trees near open water, wetlands, or rivers.	High
Golden Eagle (<i>Aquila chrysaetos</i>)	BGEPA	SCP II	Open habitats with nesting often occurring in association with cliffs.	High
American Bittern (<i>Botaurus lentiginosus</i>)	BCC ^e	SCP I	Wetlands with tall emergent vegetation or tall grasslands adjacent to wetlands.	Moderate
Black Tern (<i>Chlidonias niger</i>)	BCC	SCP I	A variety of wetland types with relatively shallow water and an even mix of open water and emergent vegetation, preferably surrounded by grassland.	Moderate
Bobolink (<i>Dolichonyx oryzivorus</i>)	BCC	SCP II	A variety of open grassland habitats, including native and tame grasslands, hayfields, no-till croplands, wet meadows, etc., with moderate-to-tall dense vegetation.	High
Canvasback (<i>Aythya valisineria</i>)	N/A	SCP II	Deep, semipermanent wetlands and lakes with emergent vegetation.	Moderate
Chestnut-collared Longspur (<i>Calcarius ornatus</i>)	BCC	SCP I	Shortgrass prairie or mixed-grass prairie that has been grazed or mowed.	High

Common Name (Scientific Name)	Federal Status ^a	State Status ^b	Habitat Requirements ^c	Likelihood of Occurrence ^d
Ferruginous Hawk (<i>Buteo regalis</i>)	N/A	SCP I	Expansive open grasslands and shrublands; often nests in solitary trees or shrubs, though will sometimes nest on the ground.	High
Franklin's Gull (<i>Leucophaeus pipixcan</i>)	BCC	SCP I	Large prairie wetlands with a mix of open water and emergent vegetation; will use agricultural fields for foraging.	High
Lesser Scaup (<i>Aythya affinis</i>)	N/A	SCP II	Large wetlands with emergent vegetation and associated upland habitat.	Moderate
Marbled Godwit (<i>Limosa fedoa</i>)	BCC	SCP I	Expansive wetland complexes with associated grasslands; will also use uplands and roadside ditches for foraging.	Moderate
Nelson's Sparrow* (<i>Ammodramus nelsoni</i>)	BCC ^e	SCP I	Freshwater wetlands or moist areas with dense emergent vegetation or dense grass.	Moderate
Northern Harrier (<i>Circus hudsonius</i>)	BCC ^f	SCP II	Large, open grasslands or marshes with tall, dense vegetation; will also use cropland, pastures, shrubby fields, and fallow fields for foraging.	High
Northern Pintail (<i>Anas acuta</i>)	N/A	SCP II	Wetland complexes with open water and associated upland prairie; prefers native prairie but will also use Conservation Reserve Program (CRP) lands, hayfields, pastures, and weedy field borders.	Moderate
Sharp-tailed Grouse (<i>Tympanuchus phasianellus</i>)	N/A	SCP II	Mixed-grass prairie with scattered shrubs or small trees; leks are generally found on elevated, less vegetated areas compared to the surrounding area.	Moderate
Swainson's Hawk (<i>Buteo swainsoni</i>)	BCC ^e	SCP I	A variety of open grasslands with scattered trees and shrubs; will also use cropland and pastures. Nests may be placed in small clumps of isolated trees or shelterbelts, though will sometimes nest on the ground.	High
Willet (<i>Tringa semipalmata</i>)	BCC	SCP II	Expansive wetland complexes with associated grasslands; prefers shallow wetlands without dense emergent vegetation.	Moderate

Common Name (Scientific Name)	Federal Status ^a	State Status ^b	Habitat Requirements ^c	Likelihood of Occurrence ^d
Wilson's Phalarope (<i>Phalaropus tricolor</i>)	N/A	SCP I	Open wetlands with associated upland grasslands or wet meadows.	Moderate
BATS				
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	FT	SCP I	Interior forest species; however, will use a variety of woodland habitats. Roost generalist. Roosts under bark, cavities, or crevices of dead and living trees during summer. Colonies can be found in fabricated structures as well.	Low
Big Brown Bat (<i>Eptesicus fuscus</i>)	N/A	SCP I	Habitat generalist, including urban and rural habitats, but often associated with trees; will also use fabricated structures for roosting.	High
Little Brown Bat (<i>Myotis lucifugus</i>)	N/A	SCP I	Inhabits caves, mines, forests, and agricultural areas. Colonies can be found in fabricated structures as well.	Moderate

^a Federal status: BCC= Bird of Conservation Concern (USFWS 2008); BGEPA = Bald and Golden Eagle Protection Act; FE = ESA-listed as endangered; FT = ESA-listed as threatened; N/A = No federal and/or state status.

^b State status indicates North Dakota SWAP (Dyke et al. 2015) SCP Level I, II, or III.

^c (Dyke et al. 2015).

^d Likelihood of Occurrence: Low = species range intersects the 2019 Study Area but no or minimal suitable habitat is present; Moderate = species range intersects the 2019 Study Area and suitable habitat is likely present or the species is known to have occurred within the 2019 Study Area or the general vicinity; High = species range intersects the 2019 Study Area and high-quality suitable habitat is present within and/or populations are known to exist within the general vicinity of the 2019 Study Area; Unknown = species range intersects the 2019 Study Area but the extent of suitable habitat within the 2019 Study Area is unknown.

^e At the time of Tier 1 through 3 studies, this species was considered BCC (USFWS 2008). However, the USFWS has since removed this species from their list of BCC for the Prairie Pothole BCR (USFWS 2021a).

^f At the time of Tier 1 through 3 studies, this species was not considered BCC (USFWS 2008). However, the USFWS has since added this species to their list of BCC for the Prairie Pothole BCR (USFWS 2021a).

Northern long-eared bat: The northern long-eared bat is a ESA-listed threatened species and is considered a rare species in North Dakota (NDGF 2016a). The USFWS recognizes every county in North Dakota as being within the range of northern long-eared bat (USFWS 2018a); however, no maternity roost trees or hibernacula have been reported for this species in North Dakota (USFWS 2019b), and the Project Area is located outside of the core range for this species. The SWAP identifies the Turtle Mountains and riparian corridors of the Little Missouri and Missouri Rivers as key areas of northern long-eared bat habitat. The Turtle Mountains are approximately 180 miles north of the 2019 Study Area; the Missouri River is approximately 33 miles west.

Publicly documented northern long-eared bat presence in North Dakota is west of the Missouri River within the Missouri River Valley, the Badlands of North Dakota, and the Moreau Prairie. Confirmed northern long-eared presence via acoustic recordings or mist netting ranged from approximately 53 to 187 miles west and northwest of the 2019 Study Area (Nelson et al. 2015; Shank et al. 2015).

Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats, as well as interspersed non-forested habitats (i.e., emergent wetlands, shelterbelts adjacent to agriculture fields, and pastures). Northern long-eared bats prefer mature forest as foraging habitat but can also use younger riparian forests, open forest corridors, wooded ponds, emergent wetlands, adjacent agriculture fields, and wooded shelterbelts (Foster and Kurta 1999). Linear features, such as fencerows, riparian forests, and other wooded corridors, can serve as suitable habitat for northern long-eared bat. The 2019 Study Area does contain wooded shelterbelts and limited forested area adjacent to agriculture fields.

Northern long-eared bats are roost generalists and utilize a broad array of roost characteristics, including roost types (e.g., cavities, crevices, exfoliating bark) and tree species (Carter and Feldhamer 2005; Timpone et al. 2010). Northern long-eared bat roost species can vary by geographic location and site characteristics (Whalen and Krusac 2014).

USFWS guidelines define suitable northern long-eared bat habitat as forests and woodlots containing potential roost trees; however, buildings, barns, bridges, and bat houses may also be considered potential summer habitat for northern long-eared bat. Trees with a diameter at breast height greater than or equal to 3.0 inches (7.6 centimeters) and that have exfoliating bark and/or cavities are defined as potential roosts. Northern long-eared bat roost trees may include individual trees when they exhibit characteristics of a potential roost and are within 1,000 feet (ft; 305 meters [m]) of other forested/wooded habitat (USFWS 2019c).

Tier 2 desktop analysis identified 426.9 acres (approximately 0.35 percent of the 2019 Study Area) of potentially suitable northern long-eared bat habitat from 248 forested areas and wooded shelterbelts (**Figure 6, Bat Resources**). The median forested area of potential suitable habitat was 1.4 acres. The size of woodlots ranges from 0.09 to 8.65 acres. On-site reconnaissance confirmed that forested area within the 2019 Study Area has low connectivity and high fragmentation, which limits the potential for foraging, commuting, and suitable northern long-eared bat habitat. However, as previously mentioned, northern long-eared bats are roost generalists, and roost tree species exhibiting preferential roost characteristics were documented within the 2019 Study Area

during a site visit on June 12–June 13, 2019 (Atwell 2020a). Therefore, occurrence of northern long-eared bat within the 2019 Study Area is possible, though unlikely.

Whooping crane: The whooping crane is ESA-listed as endangered. Designated critical habitat for whooping crane is not present within Logan or McIntosh Counties, North Dakota (USFWS 2016a; USFWS 2019d). The Aransas/Wood Buffalo population (AWP) is the only self-sustaining population in existence (Urbanek and Lewis 2015) and was estimated at 505 individuals in 2017 (Devokaitis 2018). Whooping cranes that constitute the AWP winter at locations in the Texas Gulf Coast, including the Aransas National Wildlife Refuge. In the spring, the population migrates northward to its nesting grounds at Wood Buffalo National Park in Alberta and the Northwest Territories of Canada, passing through North Dakota en route. Cranes return to Texas in the fall, following approximately the same pathway on both their northern and southern migrations. Whooping cranes occur in North Dakota in the spring from April into May and in the fall from October into November. However, this species does not breed in North Dakota (Urbanek and Lewis 2015).

Concentrated stopover use within North Dakota appears to be located within the northwestern part of the state (Pearse et al. 2015). Cranes are known to utilize a variety of wetland habitats within an agricultural landscape during migration stopover (USFWS 2009). Potentially suitable stopover habitat exists within the 2019 Study Area. Mapped NWI wetlands associated with stream corridors are present throughout the 2019 Study Area, particularly in the southern and northeastern portions of the 2019 Study Area. The northeastern portion of the 2019 Study Area appears to have the heaviest concentration of prairie pothole features with associated emergent wetlands (**Figure 7, Avian Resources**).

Researchers have defined whooping crane migration corridors using accrued sightings reported by the public from 1942 to present, including locations from telemetered birds between 2010 and 2016. The migration corridor has been delineated with 50 percent, 75 percent, and 95 percent core areas. The 95 percent core area (i.e., the area containing 95 percent of all recorded observations) averages 183 miles (294 kilometers [km]) in width (Pearse et al. 2018). The 2019 Study Area is located within the 75 percent migration corridor (**Figure 7, Avian Resources**). Stopover data (USFWS unpublished data) indicate that whooping crane observations have occurred within relatively close proximity to the 2019 Study Area (i.e., within 5 miles). The observations occurred between October 31 and November 6, 2011 and consisted of four individuals loafing in a pond and feeding in nearby fields approximately 5 miles southwest of the 2019 Study Area. Whooping crane observations have not been previously reported from within the 2019 Study Area boundaries.

Other publicly available data sources, such as the Avian Knowledge Network (AKN) have not reported observations of whooping cranes in McIntosh County (AKN 2019). The federal crane observation database does not indicate that whooping cranes historically congregated at NWI wetlands within 5 miles of the 2019 Study Area, despite the presence of potential stopover habitat (USFWS unpublished data). Sizable wetland complexes occur within at least 5 miles of the eastern boundary of the 2019 Study Area (**Figure 5, Site Evaluation**).

In sum, there is a moderate likelihood that whooping cranes could utilize available stopover habitat within the 2019 Study Area.

Piping plover and red knot: In the Northern Great Plains, piping plovers utilize alkali lakes, freshwater lakes, reservoirs, and rivers. No critical habitat occurs within the 2019 Study Area; however, Logan County does contain designated critical habitat for the piping plover within Baltzer WPA, approximately 3 miles northeast of the 2019 Study Area (**Figure 5, Site Evaluation**). McIntosh County also contains critical habitat for this species, approximately 10.5 miles east of the 2019 Study Area (USFWS 2019d).

Similarly, natural wetland features such as freshwater lakeshores and alkali lakes may also provide suitable migration stopover habitat for red knot, another ESA-listed threatened migratory shorebird species. Red knots do not breed in North Dakota, and critical habitat has not been designated for this species (USFWS 2019a). In general, the red knot is a scarce migrant within the state (AKN 2019); however, it is possible that red knots could use similar alkaline wetland features within piping plover designated critical habitat in Logan or McIntosh Counties.

It is unclear whether the 2019 Study Area includes alkali wetland features that could provide suitable stopover habitat for piping plover or red knot. Tier 3 field studies would help to identify use of habitat within the 2019 Study Area by these two ESA-listed species.

Bald eagle: Bald eagles require large mature trees in which to build their nests, typically near open water. They have strong nest site fidelity and will often build more than one nest within their territory (Buehler 2000). Bald eagles likely utilize the 2019 Study Area across multiple seasons within the annual cycle, particularly during spring and fall migration periods (AKN 2019).

A 2009 statewide census did not document any bald eagle nests in Logan or McIntosh Counties; however, two occupied nests were documented in southern Kidder County, north of the 2019 Study Area along the Missouri River (Johnson 2009) (specific locations within the county were not disclosed in this report). Since the publication of this report, the nesting bald eagle population in North Dakota has more than doubled (NDGF 2016b). It is possible that eagles may have begun nesting in Logan or McIntosh County since data was last published. For example, citizen science data from Logan County indicates some small lakes, such as Beaver Lake, may host one or more nesting pairs (AKN 2019). Small, isolated patches of trees associated with wetlands or riparian areas within the 2019 Study Area may also provide suitable bald eagle breeding habitat.

Golden eagle: The western population of golden eagle prefers open habitats during migration and winter (Kochert et al. 2002), and this habitat signature is prevalent in the vicinity of the 2019 Study Area. Golden eagles likely breed farther west of the 2019 Study Area as the primary breeding range has been delineated mainly in the western half of the state (Dyke et al. 2015; AKN 2019). Golden eagles likely migrate through the 2019 Study Area and are known to winter within south-central counties of North Dakota (Kochert et al. 2002; AKN 2019). As such, it is possible that golden eagles could occur within the 2019 Study Area across multiple seasons.

4.1.1. North Dakota Species of Conservation Priority

In addition to the TES and BGEPA species above, Tier 1 and 2 analyses identified 18 additional species designated as North Dakota SCP that may occur within the 2019 Study Area as potential breeding species (see **Table 2**). As previously mentioned, SCP species are not afforded any additional regulatory protection under the ESA or North Dakota state law.

An IPaC analysis conducted in 2019 during the initial planning stages of the project indicated 10 avian species classified as BCC (see **Table 2; Appendix A**) (USFWS 2019a) had the potential to occur in the Project Area, eight of which were also listed as North Dakota SCP (Dyke et al. 2015). Atwell assessed the potential for these species to occur within the 2019 Study Area based on habitat requirements and aerial photograph interpretation.

A majority of BCC species identified in the 2019 IPaC report (USFWS 2019a) are designated as breeders (species that may breed in the Project Area or its vicinity), including the following: American bittern (*Botaurus lentiginosus*; SCP Level I), black tern (*Chlidonias niger*; SCP Level I), bobolink (*Dolichonyx oryzivorus*; SCP Level II), chestnut-collared longspur (*Calcarius ornatus*; SCP Level I), Franklin's gull (*Leucophaeus pipixcan*; SCP Level I), marbled godwit (*Limosa fedoa*; SCP Level I), Nelson's sparrow (*Ammodramus nelsoni*; SCP Level I), and willet (*Tringa semipalmata*; SCP Level II). These species all have a moderate-to-high likelihood of occurrence within the 2019 Study Area. The 2019 Study Area also intersects the primary breeding range for most of these species, though it is not within the primary range of chestnut-collared longspur and Nelson's sparrow. The 2019 Study Area is, however, within the secondary range of these two species (Dyke et al. 2015). Two species, the American golden-plover (*Pluvialis dominica*; no SCP designation) and lesser yellowlegs (*Tringa flavipes*; no SCP designation), do not nest within North Dakota and are transient migrants that occur within this region of the Northern Great Plains on an annual basis. There is potential for these species to occur within the 2019 Study Area during spring and/or fall migration. In 2021, the USFWS updated their list of BCC and, of the species listed above, American bittern and Nelson's sparrow are no longer included as BCC (USFWS 2021b). One species, golden-winged warbler (*Vermivora chrysoptera*), was a new addition to the BCC list for the Prairie Potholes BCR and is included in the updated IPaC analysis (USFWS 2021b; USFWS 2022); however, this species is not considered a North Dakota SCP.

The northeastern portion of the 2019 Study Area contains the relatively highest density of grassland habitat and pothole wetlands compared to the remainder of the 2019 Study Area. As a result, this portion of the 2019 Study Area is likely to see relatively higher abundance of grassland and wetland avian species, such as sharp-tailed grouse (*Tympanuchus phasianellus*; SCP Level II); Wilson's phalarope (*Phalaropus tricolor*; SCP Level I); a variety of duck species like northern pintail (*Anas acuta*; SCP Level II), lesser scaup (*Aythya affinis*; SCP Level II), and canvasback (*Aythya valisineria*; SCP Level II); and many of the SCP species listed above, such as chestnut-collared longspur, marbled godwit, and willet.

Raptor species have historically received more attention in collision analyses, due to an apparent higher probability of collision than other bird species given equal exposure to operating turbines (Strickland et al. 2011). Non-eagle raptor SCP species that may occur within the 2019 Study Area, particularly as breeding species, include ferruginous hawks (*Buteo regalis*; SCP Level I), Swainson's hawks (*Buteo swainsoni*; SCP Level I), and northern harriers (*Circus hudsonius*; SCP Level II).

Eleven bat species are known to occur in North Dakota, six of which may occur within the 2019 Study Area. Of the six species with ranges intersecting the 2019 Study Area, two species—big brown bat (*Eptesicus fuscus*) and little brown bat (*Myotis lucifugus*)—are considered Level I North Dakota SCP (Dyke et al. 2015; NDGF 2016c; NDGF 2016d; BCI 2019). Given the habitat requirements of these species and the presence of potentially suitable habitat within the 2019 Study Area, there is

a moderate-to-high likelihood of occurrence of big brown and little brown bat within the 2019 Study Area.

Designated Critical Habitat and habitat for species of concern: There is no Designated Critical Habitat for birds or bats within the 2019 Study Area. The nearest Designated Critical Habitat (piping plovers) is approximately 3 miles northeast of the 2019 Study Area in Logan County (**Figure 5, Site Evaluation**).

Patches of habitat that may be potentially used by TES and SCP may be found within the 2019 Study Area. The LF dataset indicated the 2019 Study Area contains approximately 22,529 acres (17.9 percent of the 2019 Study Area) of mixed-grass prairie, approximately 13,388 acres (10.6 percent of the 2019 Study Area) of planted grassland, and approximately 5,253 acres (4.2 percent of the 2019 Study Area) of pasture/hayland cover (USGS 2020a). TES and North Dakota SPC such as bobolink, chestnut-collared longspur, and northern harrier may utilize these hay/pasture areas.

The Project Area is dominated by cultivated cropland and herbaceous land cover with very little wooded habitat and no known caves or other karst landforms. Wooded bat habitat is limited to approximately 62.4 acres (wooded parcels and wooded shelterbelts or tree lines were manually delineated using satellite imagery), primarily consisting of small woodlots and shelterbelts scattered throughout the Project Area. Available wooded areas within the Project Area are highly fragmented and are all less than 10 acres in area. Most riparian areas in the Project Area do not support adjacent woodlands. Although it is possible that TES such as northern long-eared bat could use these wooded habitats, because of the limited size and fragmentation of woodlands within the Project Area, there is low potential for TES species to use these areas.

In general, use of the 2019 Study Area by species of concern is not anticipated to be higher than the surrounding regional landscape. Some species have potential to move through the 2019 Study Area during spring and fall migration, though potential stopover habitat that might cause congregations of large groups of migrating birds and bats is generally limited within the 2019 Study Area and is more prevalent northeast of the 2019 Study Area.

4.2. Question 2 and Response

Does the landscape contain areas where development is precluded by law or designated as sensitive according to scientifically credible information?

At the time of the Tier 1 and 2 analyses, USGS PAD-US version 2.0 identified one USFWS Waterfowl Production Area (WPA), two North Dakota State Lands parcels, and one USFWS Wildlife Management Area (WMA) that intersect the 2019 Study Area (USGS 2018). WPAs are public lands managed by the USFWS to preserve habitat for waterfowl and other wildlife, whereas WMAs are owned by the state of North Dakota and were established to protect and manage lands and waters for wildlife production, public hunting, trapping, fishing, and other recreational activities. Additionally, review of spatial data from NDGF indicated that four Private Lands Open to Sportsmen (PLOTS) parcels were located within or intersect the 2019 Study Area (NDGF 2021). All four of these PLOTS parcels were cross listed as Conservation Reserve Enhancement Program (CREP) easements. The NDGF holds PLOTS agreements with private landowners to conserve habitat for fish and wildlife

populations while also allowing walk-in public access for hunting. Normal farming and ranching activities are allowed in these PLOTS parcels.

Review of the USGS PAD-US version 2.1 (USGS 2020b) for the current Project Area boundary identified 10 locations within or partially within the Project Area where development is precluded by law or where the areas are identified as sensitive according to scientifically credible information. An approximately 14.6-acre portion of a parcel identified as North Dakota Surface Trust land overlaps the central portion of the Project Area (USGS 2020b). In addition, nine areas contain USFWS wetland or grassland easements, some of which contain both. In total, approximately 2,228 acres of USFWS easements were identified within the Project Area, including approximately 276 acres of USFWS grassland easements and 2,142 acres of USFWS wetland easements. Note that in some locations, grassland and wetland easements overlap (USGS 2020b). Refer to **Figure 3, Public Lands**.

Publicly available CRP spatial data were not readily available for Tier 2 studies.

4.3. Question 3 and Response

Are there plant communities of concern present or likely to be present within the site(s)?

The North Dakota Parks and Recreation Department maintains the North Dakota Natural Heritage Inventory database containing the known locations of rare animal and plant species and significant ecological communities within the state. In a November 2021 guidance letter, the Department indicates there are no known rare species or significant ecological communities documented within or immediately adjacent to the Project Area.

Some communities dominated by grasses have been described as native, or unbroken, prairie by NDGF. These areas are used as a proxy to estimate potential impacts to grassland breeding bird habitat, as discussed in **Section 6.15.2.1** of the Badger Wind CSC Permit Application. However, these areas have no jurisdictional protection or management mandates. Field verification of grassland habitat conditions further refined an understanding of where areas defined by NDGF as unbroken have been converted to agricultural production (WEST 2021). These areas were used to focus siting project infrastructure to avoid impacts to unbroken grassland habitat to the extent practical.

Badger Wind continues to coordinate with USFWS and NDGF to refine a site layout that minimizes impacts to unbroken grassland habitat (for upland game birds) and wetlands (for waterfowl) to the extent practical.

4.4. Question 4 and Response

Are there known critical areas of congregation of species of concern, including, but not limited to: maternity roosts, hibernacula, staging areas, winter ranges, nesting sites, migration stopovers or corridors, leks, or other areas of seasonal importance?

Based on Tier 2 site reconnaissance and desktop study, no known critical areas of congregation for species of concern were identified within the 2019 Study Area, though it is possible that the 2019

Study Area supports potential stopover habitat for ESA-listed endangered whooping cranes lek/nesting habitat for sharp-tailed grouse, and nesting sites for raptors.

As previously mentioned, no maternity roost trees or hibernacula have been reported for northern long-eared bats in North Dakota (USFWS 2019b). While some small forests, woodlots, and shelterbelts may provide suitable summer habitat for northern long-eared bats, maternity roosts are unlikely within the 2019 Study Area given a lack of available forested habitat. This species may occur as spring or fall migrants within the 2019 Study Area.

While whooping cranes do not breed in North Dakota, potentially suitable stopover habitat may exist within the 2019 Study Area. A Tier 2 desktop stopover habitat assessment was conducted to assess the likelihood of whooping crane stopover use within the current Project Area relative to four reference areas (Atwell 2021a). This assessment was conducted for a December 2020 Project Area (hereafter referred to as the whooping crane assessment area) that is similar in size and location to the current Project Area boundary. The reference areas were of equal shape and dimension at equal distances from the Project's centroid in each of the four cardinal directions (north, south, east, and west). The reference areas were spaced to be adjacent to, but without overlapping, the whooping crane assessment area. Due to the whooping crane assessment area configuration and to avoid overlap, the west and east reference areas were slightly farther from the whooping crane assessment area than the north and south reference areas. The results of the analysis generally confirmed that on a regional basis, and in comparison, to four reference areas adjacent to the whooping crane assessment area, the Project had been sited in an area that has relatively lower quality and quantity whooping crane stopover habitat. The whooping crane assessment area primarily comprises croplands, has the relatively lowest portion of wetland and water habitat, and is located in the 75th percentile of the whooping crane migration corridor. Areas to the west (which are located in the 50th percentile migration corridor) and to the north and east (which have a relatively higher percentage of wetlands and waters) have relatively more potentially suitable whooping crane stopover habitat (Atwell 2021a).

Sharp-tailed grouse is a North Dakota SCP Level II species that likely occurs year-round within the 2019 Study Area (Dyke et al. 2015). This species utilizes a breeding strategy known as "lekking" in which multiple males gather at a particular site to display and compete for spectating females (i.e., potential mates) (NDGF 2019). The North Dakota SWAP identified Logan and McIntosh Counties as being entirely within the primary range for this species and indicates that sharp-tailed grouse are most common within the Missouri Slope region. Preferred habitat includes mixed-grass prairie with scattered shrubs or small trees. Leks are generally found on elevated, less vegetated areas compared to the surrounding area (Dyke et al. 2015). As such, the 2019 Study Area is likely to contain habitat to support sharp-tailed grouse leks, particularly in the north and northeastern portions of the 2019 Study Area.

Raptors may migrate over the 2019 Study Area but are generally expected to be dispersed over the broader landscape prior to reaching the 2019 Study Area. Migrating raptor species will often use ridgelines and shorelines of large bodies of water to assist with thermal lift and navigation during migration (Liguori 2005), potentially resulting in high concentrations near these features during migration. Topography throughout most of the 2019 Study Area is generally similar to the surrounding landscape and is not expected to attract or concentrate migrating raptors. However,

steeper topographic relief associated with the Missouri Coteau in the northern and northeastern portions of the Project has potential to create thermals and attract migrating raptors. Furthermore, grassland and wetland habitats located in the northern and northeastern portions of the 2019 Study Area may provide a larger prey base for raptors compared to the more cropland-heavy areas in the southern portion of the 2019 Study Area. Therefore, raptor use may be relatively higher in northern and northeastern portions of the 2019 Study Area. Tier 3 avian use studies would help to identify whether raptor use is concentrated within any particular region of the 2019 Study Area.

No landscape features identified within the 2019 Study Area are expected to concentrate migrating passerines, which could result in higher-than-expected fatality rates. The 2019 Study Area is predominantly covered by cultivated cropland and herbaceous land cover and contains very little forested and wetland habitat. No particular habitat resources are likely to attract passerine migrants to the 2019 Study Area.

No globally or state recognized Important Bird Areas (IBA) are within 10 miles of the 2019 Study Area. The closest IBA is Appam Lake Waterfowl Protection Area (located approximately 16 miles to the north of the 2019 Study Area in Kidder and Logan Counties, N46.655954° W99.56191°). This IBA is a state-recognized IBA (National Audubon Society 2019) and provides important breeding habitat for piping plovers (Chipley et al. 2003).

4.5. Question 5 and Response

Using best available scientific information has the developer or relevant federal, state, tribal, and/or local agency identified the potential presence of a population of a species of habitat fragmentation concern?

Existing vegetation in the Study and Project Areas is summarized using LF's EVT dataset (USGS 2020a). Ruderal or semi-natural vegetation types are classified using the U.S. National Vegetation Classification (Comer et al. 2003; NCSU 2021). The results of this analysis show that the Project Area is dominated by cropland (approximately 39.4 percent) (**Figure 6, Bat Resources**).

Mixedgrass prairie accounts for approximately 29.2 percent of cover in the Project Area. Planted grasslands represent approximately 14.7 percent of cover within the Project Area. Herbaceous riparian areas account for approximately 6.7 percent cover of the Project Area. These grassland and riparian areas are particularly prevalent in the northern and northeastern portions of the Project Area (**Figure 6, Bat Resources**). These areas may be susceptible to fragmentation from location of project infrastructure. Tier 1 and 2 analyses have identified several grassland bird species susceptible to habitat fragmentation that may be present within the Project Area, including SCP such as bobolink, chestnut-collared longspur, northern harrier, and sharp-tailed grouse (WEST 2021).

4.6. Question 6 and Response

Which species of birds and bats, especially those known to be at risk by wind energy facilities, are likely to use the proposed site based on an assessment of site attributes?

Landscape characteristics within the 2019 Study Area and publicly available information of distribution ranges, habitat requirements, and known occurrences in North Dakota collectively indicate that several species of birds and bats known to be vulnerable to impacts from wind energy facilities may use the 2019 Study Area on a limited basis. These species also have potential to use relatively higher quality habitat in the vicinity of the 2019 Study Area. These species include, but are not limited to, cave and tree-roosting migratory bats, nesting and migrating raptors, and breeding and migratory land birds.

4.6.1. Cave and Tree-roosting Migratory Bats

As previously mentioned, 11 species of bats are known to occur in North Dakota, six of which may occur within the 2019 Study Area. This includes big brown bat, eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), little brown bat, northern long-eared bat, and silver-haired bat (*Lasiurus cinereus*) (NDGF 2016c; NDGF 2016d; BCI 2019). One of these species, northern long-eared bat, is ESA-listed as threatened (USFWS 2019a) and is also considered a Level I North Dakota SCP. Two additional species, big brown bat and little brown bat are also considered Level I North Dakota SCP. SCP are a conservation priority for the state under the North Dakota SWAP (Dyke et al. 2015) but are not protected under state law. The little brown bat is known for forming maternity colonies in artificial structures and foraging over water (BCI 2019). The little brown bat was heavily impacted by white-nose syndrome (WNS) in the eastern part of its range and is currently under review for federal listing (USFWS 2019e).

Arnett and Baerwald (2013) summarized the results of post-construction bat mortality monitoring studies at wind facilities across five regions in the United States and Canada between 2000 and 2011. The Great Plains region (which includes North Dakota) had moderately high fatality rates on average, though results were highly variable. This region had the second lowest fatality estimate of the five regions examined (Arnett and Baerwald 2013). While Arnett and Baerwald (2013) do not focus heavily on habitat features, they note that wind facilities within the Great Basin/Southwest Open Range-Desert region typically reported the lowest mean fatality rates and were generally located in areas with few roosting and foraging areas, and possibly outside of migratory pathways (Arnett and Baerwald 2013). This suggests that placing turbines away from potential roosting and foraging areas may help to reduce bat fatalities. Given the overall land cover within the 2019 Study Area, the Project is not expected to take bats at a greater rate than other wind facilities in the Great Plains region.

Migratory tree bats are among the most affected species at wind farms across North America and Canada (Arnett and Baerwald 2013). Collision risk for bats within the 2019 Study Area is expected to follow national trends with migratory tree bats, such as eastern red, hoary, and silver-haired bats, comprising a majority of fatalities. It is unlikely that bats would utilize the 2019 Study Area for summer roosting given the relative lack of forested roosting habitat within the 2019 Study Area. More likely utilization of the 2019 Study Area would be during migration.

The known distribution and specific habitat requirements of northern long-eared bats indicate that this species could potentially occur within the 2019 Study Area (USFWS 2019f). In particular, this species may occur as a migrant within the 2019 Study Area, but the absence of high-quality woodlands within the 2019 Study Area and Project Area and climate limit the species' likelihood to

occur as summering or wintering species. Limited patches of deciduous woodland that may provide summer roosting habitat and foraging habitat exist within the 2019 Study Area.

The 2019 Study Area is within the WNS zone, per the USFWS WNS Zone Final 4(d) Rule and the current WNS zone map issued on May 31, 2019 (USFWS 2019g). As such, incidental take is prohibited under the following circumstances:

1. If it occurs within a hibernaculum.
2. If it results from tree removal activities, and
 - a. the activity occurs within 0.25 miles of a known, occupied hibernaculum, or
 - b. the activity cuts or destroys a known, occupied maternity roost tree or other trees within a 150-ft radius from the maternity roost tree during the pup season from June 1 through July 31 (USFWS 2016b).

Impacts to woodland habitat will be avoided where feasible. If some tree removal is unavoidable, this removal will be completed in accordance with tree clearing restrictions for northern long-eared bat as described in the USFWS 4(d) rule (USFWS 2015a) or coordinated with USFWS prior to tree clearing activities.

As noted by USFWS, deaths of northern long-eared bats caused by wind turbines have been documented (USFWS 2015b), though relatively few individuals of this species are generally found as fatalities during post-construction monitoring surveys. For example, the American Wind Wildlife Institute (AWWI) found that, based on 190 post-construction studies between 2006 and 2016, only six northern long-eared bat fatalities were discovered at wind farms, representing approximately 0.05 percent of fatality incidents (Allison 2018).

The 2019 Study Area is dominated by cultivated cropland, a non-ideal habitat for bats. Using aerial imagery, Badger Wind delineated bat habitat within the 2019 Study Area by using a 1,000-ft buffer around forested areas greater than 5 acres and around connective woodlands (i.e., forest patches of less than 5 acres connected to the larger forest parcels; **Figure 6, Bat Resources**). The highest concentration of bat habitat occurs in the southern portion of the 2019 Study Area, generally associated with shelterbelts (**Figure 6, Bat Resources**). Reducing turbine placement within this 1,000-ft buffer to the greatest extent feasible may help to reduce bat fatalities during project operation.

4.6.2. Nesting and Migratory Raptors

The predominance of open, agricultural cropland and herbaceous habitat greatly reduces the 2019 Study Area's suitability for tree-nesting raptors. Occasional shelterbelts and small woodlots identified during site reconnaissance may provide suitable raptor nesting habitat, but the overall density of breeding raptors in the 2019 Study Area is expected to be low. BGEPA species and state raptor SCP with potential to occur within the 2019 Study Area are discussed in more detail below.

Bald eagles are known to occur within Logan and McIntosh Counties (AKN 2019). This species prefers to nest in tall trees near bodies of water where prey resources (e.g., fish, waterfowl) are

available (Buehler 2000). While the 2019 Study Area generally lacks the habitat features typical for nesting bald eagles, the NDGF indicated that bald eagles have nested in Kidder County, north of the 2019 Study Area (Johnson 2009), and an increasing bald eagle population in the state (NDGF 2016b) may indicate a possibility that bald eagle nests exist in Logan and McIntosh Counties. Therefore, this species may use the 2019 Study Area, most likely during both spring and fall migration periods. The absence of large riparian zones, lakes, and other concentrating natural features may decrease bald eagle use of the 2019 Study Area. Bald eagle winter roosts likely do not occur within the 2019 Study Area because few habitat features conducive to large winter roosts, such as larger super-canopy trees within a woodland tract near water, are present (Buehler 2000).

As previously mentioned, golden eagles are more likely to nest in the western portion of North Dakota (Dyke et al. 2015; AKN 2019); however, this species is known to have a limited and scattered presence in the vicinity of the 2019 Study Area and may occur within the 2019 Study Area during spring and fall migratory periods, as well as in winter (AKN 2019).

The 2019 Study Area also has potential habitat to support other species of breeding and migratory raptors, such as red-tailed hawk (*Buteo jamaicensis*), ferruginous hawks (SCP Level I), Swainson's hawks (SCP Level I), and northern harriers (SCP Level II) among others. Beston et al. (2016) found that in general, Accipitriformes (i.e., diurnal birds of prey) tended to have a higher proportion of fatalities due to turbines and a higher risk of turbine-caused fatality compared to other species groups. The risk of collision mortality for some raptor species, such as northern harrier, tended to be rather low (Smith et al. 2011; Beston et al. 2016)

4.6.3. Breeding and Migratory Land Birds

A variety of migratory birds may move through and utilize the 2019 Study Area seasonally. Neotropical migrant species likely move over the 2019 Study Area during both during the day and nocturnally (AKN 2021). The 2019 Study Area includes limited woodland and/or shrubland habitat that could be used by neotropical migrants during stopover events. Habitat and topographical features found within the 2019 Study Area are not expected to attract large congregations of birds during migration at a rate greater than the surrounding landscape. Although habitat features (e.g., water bodies, escarpments, conservation areas) that would concentrate large numbers of birds are minimal throughout most of the 2019 Study Area, the occurrence of any scattered wetlands, small open water features, or seasonally flooded agricultural fields could potentially provide some stopover or breeding habitat for shorebirds, waterbirds, and waterfowl species. The northeastern portion of the 2019 Study Area contains prairie pothole ponds and relatively larger tracts of herbaceous land cover. This area may see a higher proportion of waterfowl, waterbirds, shorebirds, and grassland birds compared to more southern portions of the 2019 Study Area. Minimizing turbine placement within the vicinity of this wetland-grassland complex to the greatest extent feasible will help to reduce direct impacts to avian species, such as collisions with turbines and habitat loss, as well as indirect impacts, such as displacement (Shaffer and Buhl 2016).

At the time of Tier 1 and 2 studies, the USFWS list of BCC species for the Prairie Potholes BCR contained 27 species. IPaC analyses for the 2019 Study Area specifically indicate 10 BCC species that are either BCC for the Prairie Potholes BCR or BCC throughout their ranges within the continental United States and Alaska. These include species with potential to breed within the 2019

Study Area, such as American bittern, black tern, bobolink, chestnut-collared longspur, Franklin's gull, marbled godwit, Nelson's sparrow, and willet, as well as species considered transient, such as American golden-plover and lesser yellowlegs (**Appendix A**) (USFWS 2019a). American bittern and Nelson's sparrow have since been removed from the USFWS BCC list for the Prairie Potholes BCR (USFWS 2021b).

Several avian species are common in agricultural areas of North Dakota and have potential to occur in the 2019 Study Area. In particular, the horned lark (*Eremophila alpestris*) is one of the most widely distributed species in North America (Beason 1995), and dramatic declines are widespread (Sauer et al. 2017). Horned Larks are one of the most commonly recorded mortalities at North American wind farms (Erickson et al. 2001; Erickson et al. 2014).

4.7. Question 7 and Response

Is there a potential for significant impacts to species of concern based on the answers to the questions above, and considering the design of the proposed site?

The potential for significant impacts to species of concern within the 2019 Study Area is expected to be low. Like other wind energy projects in the Midwest, there is potential for the Project to impact some bird and bat species of conservation concern, including TES and SCP, migratory bat species, migrating and nesting raptors, and grassland birds. Potential impacts are more likely to occur within the northern and northeastern portions of the 2019 Study Area due to the presence of relatively larger tracts of herbaceous land cover and a greater presence of wetlands. This is compared to the southern portion of the 2019 Study Area where agricultural habitat dominates and the landscape is more fragmented. Siting of project infrastructure in agricultural lands and away from proximate areas of relatively higher quality habitat and the avoidance of relatively higher quality patches of habitat is expected to reduce impacts to species of concern. Adverse population-level impacts to species of concern are unlikely to occur.

4.8. Tiers 1 and 2 Decision Point

Tier 3 pre-construction studies were concluded to be warranted to further assess the potential for direct and indirect impacts from the Project on bird and bat species. Tier 1 and Tier 2 review indicated that ESA-listed species have known ranges that intersect the 2019 Study Area and habitat for these species may exist within the 2019 Study Area. While a large portion (approximately 39.4 percent) of the Project Area consists of active croplands; mixedgrass prairie, planted grasslands, and herbaceous riparian areas accounts for approximately 50.6 percent of the Project Area. These communities are present particularly in the northern and northeastern portions of the 2019 Study Area. Open water and wetland habitat (approximately 0.4 percent of the Project Area) is also present, including prairie potholes in the northeastern portion of the 2019 Study Area (USGS 2020a). These habitats may attract a variety of avian species of concern, including TES and SCP. Several species identified as SCP are also susceptible to grassland habitat fragmentation.

The potential for maternity roosts of protected bat species to occur within the 2019 Study Area is low, as minimal habitat exists within the 2019 Study Area. Several bat species are likely to migrate through the 2019 Study Area. While bald eagle nests are not known from Logan or McIntosh Counties, the nesting bald eagle population in North Dakota is increasing, and habitat within the

vicinity of the 2019 Study Area may support nests that were not previously known. Furthermore, bald eagles may move through the 2019 Study Area during migration or travel between foraging and breeding or roosting sites. Similarly, a variety of other breeding and migratory raptors, land birds, waterfowl, and shorebirds are likely to use the 2019 Study Area and surrounding region.

Tier 3 field studies provide additional information to further assess potential impact risk to bird and bat species that may use the 2019 Study Area, such as migratory tree bats, breeding and migratory land birds, sharp-tailed grouse, and nesting and migratory raptors. Tier 3 surveys also help to determine whether the habitat is being used by any protected species. Therefore, based on Tier 1 and 2 analysis, Tier 3 pre-construction studies were concluded to be warranted to further assess the potential for direct and indirect impacts from the Project on bird and bat species. In the interest of completing a more robust due diligence Badger Wind completed a full suite of Tier 3 field studies including bat acoustic surveys, nesting eagle and raptor surveys, grouse lek surveys, avian point count surveys for a more robust due diligence.

5. TIER 3—FIELD STUDIES TO DOCUMENT SITE WILDLIFE AND HABITAT AND PREDICT PROJECT IMPACTS

As described previously, the Badger Wind Project Area boundary has been reconfigured over the course of project development. Tier 3 field studies that are described in **Section 5** were designed in April 2019 for a larger survey area that has since been refined to the current Project Area (referred to as the 2019 Study Area). Approximately 97 percent of the current project boundary is contained within the 2019 Study Area. All map figures included in this BBCS show the current project boundary in relation to the 2019 Study Area boundary that was used during Tier 3 field studies.

Avian and bat pre-construction studies for the Project were conducted from May 2019 to April 2021, based on Tier 1 and Tier 2 analyses and coordination with USFWS and NDGF (see **Table 1**). Final reports for these studies are provided in **Appendix B**.

Tier 3 studies completed for the Project included the following studies:

- **Bat Acoustic Survey, Year 1:** Acoustic bat monitoring occurred within the 2019 Study Area from May 23–October 16, 2019, at one meteorological evaluation tower (MET tower) and at four ground-based locations representative of potential turbine locations within the Project (**Figure 6, Bat Resources**). The raised MET tower location was paired with a ground-based location. Two of the four ground locations were within the current Project Area boundary and the raised MET tower location was located just south of the current Project Area boundary. Song Meter full spectrum ultrasonic detectors (SM3 or SM4) were used throughout the duration of the study. The four ground-based units were deployed on May 23rd and remained in place over the course of the entire survey period (with the exception of one unit, which only recorded through October 9th due to technical issues). The one raised MET tower unit was not deployed until July 30, 2019, due to damaged MET tower components that delayed deployment until repairs were made. Calls were recorded from ½ hour before sunset to ½ hour after sunrise. Calls were then analyzed for species identification using Kaleidoscope Pro 4.2.0 (Kaleidoscope), which is approved for analysis by the USFWS. All calls underwent qualitative analysis by a biologist with sufficient bat acoustic call vetting experience through visual comparison of echolocation call metrics (i.e., call sequence activity and call duration, call slope, minimum frequency, and individual call characteristics representative of individual species) (Atwell 2020b).
- **Bat Acoustic Survey, Year 2:** Acoustic bat monitoring occurred within the 2019 Study Area from April 14–October 15, 2020, at two MET towers and at four ground-based locations representative of potential turbine locations within the Project (**Figure 6, Bat Resources**). Raised MET tower locations were paired with ground-based locations. Two of the four ground locations and one MET tower location were within the current Project Area boundary. Song Meter full spectrum ultrasonic detectors (SM3 or SM4) were used throughout the duration of the study. The one raised MET tower was deployed on April 14, 2020, and the four ground-based units were deployed on April

- 15, 2020. All detectors remained in place over the course of the entire survey period. Calls were recorded from ½ hour before sunset to ½ hour after sunrise. Calls were then analyzed for species identification using Kaleidoscope, which is approved for analysis by the USFWS. All calls identified by the software as a potential *Myotis* species or unidentified species underwent qualitative analysis by a biologist with sufficient bat acoustic call vetting experience through visual comparison of echolocation call metrics (i.e., call sequence activity and call duration, call slope, minimum frequency, and individual call characteristics representative of individual species) (Atwell 2021b).
- Eagle Use and Diurnal Avian Activity Surveys, Year 1: Eagle use and avian use point count studies occurred between May 2019 and April 2020. During year-1 eagle use surveys, all 53 point-count stations within the 2019 Study Area were surveyed for eagles and other raptors out to 800 m (meters) (the sample plot) for 60 minutes, typically once per month, when feasible. Due to the inaccessibility of some point count stations between late fall and early spring, some points were not surveyed every month, whereas others were surveyed twice per month to achieve survey effort goals. For avian use surveys, the same 53 point count stations were surveyed for all avian species out to 150 m for small-bodied bird species and 800 m for larger-bodied bird species for 10 minutes, typically once per month (when feasible) during the spring (May 2019 and March and April 2020) and fall (August through November 2019) monitoring periods (Atwell 2020c).
 - Eagle Use and Diurnal Avian Activity Surveys, Year 2: Eagle use and avian use studies occurred between May 2020 and April 2021. During year-2 eagle use surveys, all 53 point-count stations within the 2019 Study Area were surveyed for eagles and other raptors out to 800 m (the sample plot) for 60 minutes, typically once per month, when feasible. Due to the inaccessibility of some point count stations between late fall and early spring, some points were not surveyed every month, whereas others were surveyed twice per month to achieve survey effort goals. For diurnal avian activity surveys, the same 53 point count stations were surveyed for all avian species out to 300 m for small-bodied bird species and 800 m for larger-bodied bird species for 10 minutes, typically once per month (when feasible) during the spring (May 2020 and March and April 2021) and fall (August through November 2020) monitoring periods (Atwell 2021c).
 - Bald Eagle and Raptor Nest Surveys, Year-1: Eagle and raptor nest surveys were conducted on May 1–3, 2019, for the 2019 Study Area and a 10-mile buffer of the 2019 Study Area (i.e., eagle nest survey area). Nests for all raptor species were recorded within the 2019 Study Area and a surrounding 2-mile buffer area (i.e., raptor nest survey area). All eagle nests were recorded within 10 miles from the 2019 Study Area boundary. Aerial transect surveys were flown via a fixed-wing Cessna Skyhawk 172M, with transects spaced 0.5 miles apart (Atwell 2020c).
 - Bald Eagle and Raptor Nest Surveys, Year-2: Eagle and raptor nest surveys were conducted during April and May of 2020 through a combination of targeted aerial

surveys conducted on April 10, 2020, and ground-based surveys that continued through May 15, 2020. Flight time was restricted to one day of aerial surveys due to safety concerns regarding: (a) the COVID-19 coronavirus outbreak across the United States, and (b) recent aircraft incidents associated with aerial wildlife surveys at other proposed wind facilities in the region. Areas targeted for aerial surveys included the following:

- Roadless portions of the eagle nest survey area.
- Habitat-based focal areas within the eagle nest survey area, which were identified using desktop analysis of the eagle nest survey area. Large bodies of water, riparian areas, and areas with large trees that could serve as potential eagle nesting sites were prioritized when identifying target areas.
- Known eagle nests and nests of other raptor species that were found during the year 1 survey in 2019.
- Within most targeted areas, north–south oriented transects were flown via a fixed-wing Cessna Skyhawk 172M with transects spaced 0.5 miles apart. However, riparian-based transects were flown along the northern and southern edges of the Beaver Creek riparian corridor between Beaver Lake and the western edge of the eagle nest survey area.
- In addition to aerial nest surveys, all raptor nests that were found during ground-based activities, including ground-based lek surveys (discussed below), avian use surveys, and incidentally were mapped, assessed for nesting status, and were added to the project nest database. Ground-based follow-up surveys were conducted to confirm species and status for nests that could not be attributed to species during the aerial survey (Atwell 2021c).
- Sharp-tailed Grouse Lek Surveys, Year 1: Sharp-tailed grouse lek surveys were conducted between May 2 and May 10, 2019. The grouse survey area included the 2019 Study Area and extended 1 mile from the 2019 Study Area boundary. Aerial transect surveys were flown via a fixed-wing Cessna Skyhawk 172M with transects spaced 0.5 miles apart. Surveys began approximately 10 minutes before sunrise and ended approximately two hours after sunrise. Confirmed leks were defined as two or more birds together, with at least one male displaying. Possible leks were defined as auditory detections of multiple grouse that could not be verified visually after their initial detection on a ground-based survey (Atwell 2020c).
- Sharp-tailed Grouse Lek Surveys, Year 2: Similar to the year 2 eagle and raptor nest surveys, year 2 sharp-tailed grouse lek surveys were also conducted using both aerial and ground-based survey methods. Targeted portions of the grouse survey area (specifically the 2019 Study Area plus a 1-mile buffer zone around the 2019 Study Area boundary) were assessed via aerial transects on April 10, 2020. As described above, safety concerns limited flight time to one morning of aerial surveys that targeted

specific areas within the broader grouse survey area and focused on portions of the grouse survey area that could not be reached or observed from publicly accessible roadside vantage points. Targeted aerial survey areas were believed to have a higher likelihood of harboring grouse leks based on the following:

- Results from 2019 aerial grouse lek surveys.
- Observations of grouse recorded incidentally during year 1 and avian use surveys.
- Identification of potential sharp-tailed grouse breeding habitat through desktop review.
- Additional portions of the grouse survey area were sampled using three rounds of ground-based surveys between April 11 and May 15, 2020. Each round of surveys was spaced approximately 8 to 10 days apart. During each survey round, a biologist surveyed 77 publicly accessible roadside points spaced 0.5 miles (800 m) apart for two minutes, scanning visually and listening for sharp-tailed grouse vocalizations and other non-vocal sounds associated with lekking behavior.

The results of these studies are further discussed on the following sections.

5.1. Question 1 and Response

Do field studies indicate that species of concern are present on or likely to use the proposed site?

In total, 37 species of concern, including ESA-listed threatened or endangered species, eagle species listed under the BGEPA, and species listed as SCP per North Dakota's SWAP, were detected during Tier 3 field studies (**Table 3**). One unknown *Myotis* bat species (little brown bat or northern long-eared) was detected during bat acoustic studies but could not be identified to species as the calls contained characteristics of both species. One bird species listed as endangered under the ESA (whooping crane) was detected within the 2019 Study Area during Tier 3 studies.

Table 3. Seasonal Occurrence of Species of Concern Detected during Tier 3 Field Studies (2019–2021)

Common Name ^a (<i>Scientific Name</i>)	Federal Status ^b	State Status ^c	Expected Seasonal Occurrence	Seasons Detected (Year 1) ^d	Seasons Detected (Year 2) ^d	References
Birds						
Whooping Crane* (<i>Grus americana</i>)	FE	SCP III	Spring/Fall Migration	SP	Not Detected	(Atwell 2020c)
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	BGEPA; BCC ^e	SCP II	Year-round	SP, SU, FA, WI	SP, SU, FA, WI	(Atwell 2020c; Atwell 2021c)
Golden Eagle (<i>Aquila chrysaetos</i>)	BGEPA	SCP II	Spring/Fall Migration and Winter	SP, FA, WI	SP, FA, WI	(Atwell 2020c; Atwell 2021c)
American Avocet* (<i>Recurvirostra americana</i>)	N/A	SCP II	Spring/Fall Migration and Summer	SU, FA	FA	(Atwell 2020c; Atwell 2021c)
American Bittern (<i>Botaurus lentiginosus</i>)	BCC ^e	SCP I	Spring/Fall Migration and Summer	SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
American Kestrel (<i>Falco sparverius</i>)	N/A	SCP II	Spring/Fall Migration and Summer	SP, SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
American White Pelican (<i>Pelecanus erythrorhynchos</i>)	N/A	SCP II	Spring/Fall Migration and Summer	SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Baird's Sparrow* (<i>Centronyx bairdii</i>)	BCC	SCP I	Spring/Fall Migration and Summer	SP	Not Detected	(Atwell 2020c)
Black Tern (<i>Chlidonias niger</i>)	BCC	SCP I	Spring/Fall Migration and Summer	SP, SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Bobolink (<i>Dolichonyx oryzivorus</i>)	BCC	SCP II	Spring/Fall Migration and Summer	SP, SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Burrowing Owl* (<i>Athene cunicularia</i>)	N/A	SCP II	Spring/Fall Migration and Summer	FA	Not Detected	(Atwell 2020c)
Canvasback (<i>Aythya valisineria</i>)	N/A	SCP II	Spring/Fall Migration and Summer	SU	SP, SU	(Atwell 2020c; Atwell 2021c)
Chestnut-collared Longspur (<i>Calcarius ornatus</i>)	BCC	SCP I	Spring/Fall Migration and Summer	SP, SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)

Common Name ^a (<i>Scientific Name</i>)	Federal Status ^b	State Status ^c	Expected Seasonal Occurrence	Seasons Detected (Year 1) ^d	Seasons Detected (Year 2) ^d	References
Dickcissel* (<i>Spiza americana</i>)	BCC ^e	SCP II	Spring/Fall Migration and Summer	SU	SU, FA	(Atwell 2020c; Atwell 2021c)
Ferruginous Hawk (<i>Buteo regalis</i>)	N/A	SCP I	Spring/Fall Migration and Summer	SP, SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Franklin's Gull (<i>Leucophaeus pipixcan</i>)	BCC	SCP I	Spring/Fall Migration and Summer	SP, SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Grasshopper Sparrow (<i>Ammodramus savannarum</i>)	BCC	SCP I	Spring/Fall Migration and Summer	SP, SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Horned Grebe (<i>Podiceps auritus</i>)	BCC ^e	SCP I	Spring/Fall Migration and Summer	SP, SU	SP, SU	(Atwell 2020c; Atwell 2021c)
LeConte's Sparrow* (<i>Ammodramus leconteii</i>)	BCC ^f	SCP II	Spring/Fall Migration and Summer	Not Detected	SU, FA	(Atwell 2021c)
Lesser Scaup (<i>Aythya affinis</i>)	N/A	SCP II	Spring/Fall Migration and Summer	SP, SU	SP, SU	(Atwell 2020c; Atwell 2021c)
Loggerhead Shrike* (<i>Lanius ludovicianus</i>)	N/A	SCP II	Spring/Fall Migration and Summer	Not Detected	SP, SU	(Atwell 2021c)
Marbled Godwit (<i>Limosa fedoa</i>)	BCC	SCP I	Spring/Fall Migration and Summer	SP, SU	SP, SU	(Atwell 2020c; Atwell 2021c)
Nelson's Sparrow* (<i>Ammodramus nelsoni</i>)	BCC ^e	SCP I	Spring/Fall Migration and Summer	SU	SU, FA	(Atwell 2020c; Atwell 2021c)
Northern Harrier (<i>Circus hudsonius</i>)	BCC ^f	SCP II	Spring/Fall Migration and Summer	SP, SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Northern Pintail (<i>Anas acuta</i>)	N/A	SCP II	Spring/Fall Migration and Summer	SP, SU	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Peregrine Falcon (<i>Falco peregrinus</i>)	BCC ^e	SCP III	Spring/Fall Migration	SP	SP	(Atwell 2020c; Atwell 2021c)
Prairie Falcon (<i>Falco mexicanus</i>)	N/A	SCP II	Year-round	FA	SU, FA, WI	(Atwell 2020c; Atwell 2021c)

Common Name ^a (<i>Scientific Name</i>)	Federal Status ^b	State Status ^c	Expected Seasonal Occurrence	Seasons Detected (Year 1) ^d	Seasons Detected (Year 2) ^d	References
Red-headed Woodpecker (<i>Melanerpes erythrocephalus</i>)	BCC	SCP I	Spring/Fall Migration and Summer	SU, FA	SU, FA	(Atwell 2020c; Atwell 2021c)
Sharp-tailed Grouse (<i>Tympanuchus phasianellus</i>)	N/A	SCP II	Year-round	SP, SU, FA, WI	SP, SU, FA, WI	(Atwell 2020c; Atwell 2021c)
Sprague's Pipit (<i>Anthus spragueii</i>)	BCC	SCP I	Spring/Fall Migration and Summer	SU, FA	SU, FA	(Atwell 2020c; Atwell 2021c)
Swainson's Hawk (<i>Buteo swainsoni</i>)	BCC ^e	SCP I	Spring/Fall Migration and Summer	SP, SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Upland Sandpiper (<i>Bartramia longicauda</i>)	BCC ^e	SCP II	Spring/Fall Migration and Summer	SP, SU	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Western Meadowlark (<i>Sturnella neglecta</i>)	N/A	SCP II	Spring/Fall Migration and Summer	SP, SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Willet (<i>Tringa semipalmata</i>)	BCC	SCP II	Spring/Fall Migration and Summer	SP, SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Wilson's Phalarope (<i>Phalaropus tricolor</i>)	N/A	SCP I	Spring/Fall Migration and Summer	SP, SU	SP, SU	(Atwell 2020c; Atwell 2021c)
Bats						
Big Brown Bat/ Silver-haired Bat ^g (<i>Eptesicus fuscus</i> / <i>Lasionycteris noctivagans</i>)	N/A	SCP I	Spring/Fall Migration and Summer	SU, FA	SP, SU, FA	(Atwell 2020c; Atwell 2021c)
Little Brown Bat (<i>Myotis lucifugus</i>)	N/A	SCP I	Spring/Fall Migration and Summer	SU, FA	SU, FA	(Atwell 2020c; Atwell 2021c)
Unknown <i>Myotis</i> Species ^h (<i>Myotis sp.</i>)	N/A	SCP I	Spring/Fall Migration and Summer	Not Detected	FA	(Atwell 2021c)

Common Name ^a (<i>Scientific Name</i>)	Federal Status ^b	State Status ^c	Expected Seasonal Occurrence	Seasons Detected (Year 1) ^d	Seasons Detected (Year 2) ^d	References
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^a Common names marked with an asterisk indicate that the species was as an incidental observation only during two years of avian surveys.

^b Federal and state status: BCC= Bird of Conservation Concern (USFWS 2008); BGEPA = Bald and Golden Eagle Protection Act; FE = ESA Endangered; N/A = No federal and/or state status.

^c State conservation listing status indicates North Dakota State Wildlife Action Plan (SWAP) (Dyke et al. 2015) Species of Conservation Priority (SCP) Level I, II, or III.

^d For birds: SP = March–May; SU = June–July; FA = August–November; WI = December–February. Includes species detected incidentally within the 2019 Study Area. For bats: SP = April 1–May 15; SU = May 16–July 31; FA = August 1–October 16. Bat acoustic surveys were not conducted in the spring during year 1 studies.

^e At the time of Tier 1 through 3 studies, this species was considered BCC (USFWS 2008). However, the USFWS has since removed this species from their list of BCC for the Prairie Pothole BCR (USFWS 2021a)

^f At the time of Tier 1 through 3 studies, this species was not considered BCC (USFWS 2008). However, the USFWS has since added this species to their list of BCC for the Prairie Pothole BCR (USFWS 2021a)

^g Big brown and silver-haired bats were lumped during analysis due to similarities in call characteristics between the two species. Big brown bat is considered a North Dakota SCP, but silver-haired bat is not currently listed as such.

^h Calls had characteristics of northern long-eared bat and little brown bat so a species-level classification could not be determined.

Bat acoustic surveys confirmed the presence of one bat SCP (little brown bat) and the likely presence of a second bat SCP (big brown bat) (see **Table 3**). Big brown and silver-haired bat calls were lumped during analysis due to similarities in call characteristics between the two species. This group was one of the more commonly detected species during acoustic surveys; however, while big brown bat is considered a North Dakota SCP, silver-haired bat is not currently listed as such. After excluding “noise”, analysis of acoustic data with Kaleidoscope software identified 2,026 bat calls in 2019 and 1,134 calls in 2020. In 2019, this included 757 big brown bat/silver-haired bat calls and four little brown bat calls. In 2020, this included 485 big brown bat/silver-haired bat calls and three little brown bat calls. Two calls identified as an unknown *Myotis* species were also recorded but, as previously mentioned, were not identified to species as they contained characteristics of both northern long-eared and little brown bat and there were not a sufficient number of passes to identify to species (Atwell 2020b; Atwell 2021b).

One ESA-listed endangered bird species (whooping crane), two species protected under BGEPA (bald and golden eagle), and 35 North Dakota SCP (including whooping crane, bald eagle, and golden eagle) were detected incidentally and during avian use surveys (see **Table 3**).

Twelve SCP species in **Table 3** are also listed by the USFWS as BCC species for the Prairie Pothole BCR and/or throughout its range in the continental United States and Alaska (USFWS 2021b). An additional eight species were considered BCC at the time of Tier 1 through 3 studies (USFWS 2008) but have since been removed from the BCC list (USFWS 2021b). Although protected under the MBTA, similar to SCP, these species are not afforded additional protection under federal or state regulations but have been identified as part of conservation planning efforts by the USFWS.

Additional discussions of species listed in **Table 3** are included in **Section 5.3**.

5.2. Question 2 and Response

Do field studies indicate the potential for significant adverse impacts on affected populations of species of habitat fragmentation concern?

Based on Tier 3 studies, there is potential for impacts to species of habitat fragmentation concern. Although the Project Area comprises primarily cultivated croplands and pasture lands, approximately 43.9 percent of the Project Area is classified as mixed-grass prairie or planted grasslands (USGS 2020a); relatively large tracts of grassland are present, particularly within the northern and northeastern portions of the Project Area. In total, seven grassland bird SCP potentially susceptible to habitat fragmentation (WEST 2021) and likely to breed within the Project Area were documented during Tier 3 studies:

- Bobolink
- Chestnut-collared longspur
- Grasshopper sparrow (*Ammodramus savannarum*)
- Northern harrier

- Sharp-tailed grouse
- Sprague's pipit (*Anthus spragueii*)
- Upland sandpiper (*Bartramia longicauda*)

Habitat fragmentation is primarily relevant for these species during the breeding season.

The Project is not expected to have significant impacts on populations of species of habitat fragmentation concern because most infrastructure will be constructed within a previously fragmented agricultural landscape dominated by cultivated cropland. In these areas, habitat fragmentation impacts will have, for the most part, occurred prior to project development, and the Project is not expected to contribute additional cumulative impacts to habitat fragmentation. Some infrastructure may be placed within relatively larger tracts of grassland habitat; however, Badger Wind continues to coordinate with the USFWS and NDGF to refine design of the site layout to minimize grassland impacts. Furthermore, Badger Wind is working with NDGF to also address potential impacts to unbroken grasslands for upland game birds and wetlands for waterfowl.

Tier 1 and 2 desktop studies found that extensive forested habitat is not generally found within the 2019 Study Area and a high degree of woodland habitat fragmentation already exists (Atwell 2019; Atwell 2020a). Therefore, impacts to woodland species of habitat fragmentation concern are not likely to occur. Furthermore, results from Tier 3 bat surveys do not indicate that the Project will significantly and adversely impact threatened or endangered bat species by fragmenting roosting habitat.

5.3. Questions 3 and 4 and Responses

Question 3: What is the distribution, relative abundance, behavior, and site use of species of concern identified in Tiers 1 or 2, and to what extent do these factors expose these species to risk from the proposed wind energy site?

Question 4: What are the potential risks of adverse impacts of the proposed wind energy site to individuals and local populations of species of concern and their habitats? (In the case of rare or endangered species, what are the possible impacts to such species and their habitats?)

Species of concern identified in Tiers 1 and 2 and documented within the 2019 Study Area as part of Tier 3 studies are summarized in **Tables 2 and 3**. Of the TES and eagle species protected under the BGEPA that were identified during the Tier 1 and 2 analyses, whooping crane, bald eagle, and golden eagle were observed within the 2019 Study Area during Tier 3 studies. Piping plover and red knot were identified as potentially present as part of Tier 1 and 2 analyses but were not observed within the 2019 Study Area during Tier 3 studies. Similarly, northern long-eared bats were not confirmed during Tier 3 bat acoustics studies, though calls of an unknown *Myotis* species were detected, as previously discussed.

Discussion of avian and bat TES currently afforded protection under the ESA and BGEPA, as well as North Dakota SCP (including species of habitat fragmentation concern listed in **Section 5.2**), observed during Tier 3 studies is provided below.

5.3.1. ESA-Listed Avian Species

Whooping crane (ESA-listed endangered): Whooping crane was the only bird species listed as threatened or endangered under the ESA that was observed during Tier 3 field studies. As previously mentioned, the Project Area is located within the 75 percent migration corridor for this species (i.e., the area containing 75 percent of all recorded observations). During year 1 avian use studies, three adult whooping cranes were detected within the 2019 Study Area during surveys on April 15, 2020. The cranes were initially observed flying north at heights ranging from 2 to 7 m above the ground (i.e., below the rotor-swept zone [RSZ]) but were observed foraging in corn throughout the day. The whooping cranes were again present on April 16 and 17, 2020, and they roosted 0.7 miles (1.1 km) from their foraging location on those days. The roosting location was at the confluence of two riverine wetlands with seasonally flooded water regime classifications within the western portion of the current Project Area.

Of note, due to poor harvesting conditions during the fall of 2019, the whooping cranes were foraging in unharvested stands of corn. Other areas of unharvested corn were also noted within the 2019 Study Area in April 2020, perhaps dispersing whooping crane stopover use farther from the migration corridor's centerline than expected.

Some data indicate that cranes in general are at low risk of collision with wind turbines (Nagy et al. 2012). To date, no known whooping crane mortality event has occurred at an operational wind turbine (USFWS 2009; NGPC 2018). Currently, the USFWS (2009) accepts that whooping cranes actively avoid wind energy facility infrastructure out to at least 0.5 miles. Similarly, USFWS acknowledges that whooping cranes typically migrate above typical industry standard rotor-swept heights. However, data and expert biologist opinion indicate that daily forage-to-roosting flights do occur at risky flight heights, and these low flights can occur for distances up to 2 miles. If visibility conditions are poor, USFWS indicates that risky flights may occur up to 5 miles from migration stopover sites.

In contrast, power-line collision represents a notable cause of mortality events during active migration (USFWS 2009; NGPC 2018). While the overhead electric transmission line is relatively short (approximately 0.75 miles), transmission line infrastructure associated with the Project could represent potential risk to migrating cranes. Badger Wind will follow Avian Power-Line Interaction Committee (APLIC) recommendations to reduce the potential for collisions with the Project's proposed 0.75-mile transmission line. In addition, if MET towers will require guy wires, these will be marked with avian flight diverters to reduce the potential for collisions. Limiting areas of unharvested crops, where feasible, would also help limit the potential to attract whooping cranes into the Project Area during operations. In addition, if a whooping crane is sighted within the Project Area during construction, construction activities will cease within a mile of the sighting until the whooping crane has left the area, further reducing the potential for impacts to this species.

Bald eagle (BGEPA and SCP II): Over the course of pre-construction eagle use studies, 69 bald eagle detections were recorded (34 during the first year of surveys and 35 during the second year of surveys) (Atwell 2020c; Atwell 2021c). Observations occurred throughout each year of eagle use

studies, though most detections occurred during the spring and fall migratory periods. Observations refer to detections recorded during eagle use surveys.

Bald eagle mean use rates were generally low across the 2019 Study Area. Thirteen of the 69 (19 percent) bald eagle observations across the 2019 Study Area in year 1 and year 2 were recorded at station 4 and were of individuals associated with an in-use nest that was occupied in 2019 and 2020.

Among the other 52 stations, stations 11 and 18 each recorded six bald eagle observations over year 1 and year 2 surveys cumulatively. Station 12 recorded five detections over the 2-year period. Observations of small migrating groups of two to three bald eagles, which were infrequent events during the year 1 and year 2 surveys, contributed to the relatively higher numbers recorded at these three stations. The remaining 39 bald eagle detections were recorded at 26 other point count stations.

Stations 11, 12, and 18 are proximate to one another, and all three points are within 2 miles of a creek that flows northward from Wishek to Beaver Lake. All of the eagles observed at these three stations appeared to be in active migration. It is possible that migrating eagles may loosely follow this watercourse while moving through the area, slightly increasing use rates in this portion of the 2019 Study Area (Atwell 2020c; Atwell 2021c).

One in-use bald eagle nest was found within the 2019 Study Area during both the 2019 and 2020 eagle and raptor nest surveys (**Figure 7, Avian Resources; and Figure 8, Eagle and Raptor Nest Survey Results**). This nest is also located within the current Project Area boundary. No other eagle nests were found throughout the eagle nest survey area during 2019 and 2020 eagle and raptor nest surveys (Atwell 2020c; Atwell 2021c). However, on March 10, 2021, a new in-use bald eagle nest was located within the Project Area (**Figure 7, Avian Resources; and Figure 8, Eagle and Raptor Nest Survey Results**). The nest was found incidentally during eagle use surveys. The 2019–2020 and 2021 nests are believed to belong to the same nesting territory. The 2021 bald eagle in-use nest is approximately 1.98 miles (3.19 km) east of the 2019–2020 nest. The 2019–2020 nest is now classified as an alternate nest site (USFWS 2013; USFWS 2016c). The 2019–2020 nest was checked repeatedly after the March 10 discovery of the 2021 nest, and it was found to be missing and may have fallen from its substrate. Bald eagles were not observed at the old nest site during these subsequent checks. Recent guidance issued by the USFWS notes that nesting bald eagles are not expected to roam beyond 2 miles from nest sites (USFWS 2020b). The 2019–2020 alternate nest site and the 2021 in-use nest are located 2.0 miles and 2.1 miles from the nearest proposed turbine locations, respectively.

Bald eagle collision mortality associated with wind farm operations within the United States has not been widely documented (Bay et al. 2016; USFWS 2018b). However, eagles migrating through the Project Area or using the Project Area for breeding or wintering are at risk of collision with turbines. Cumulatively, 157 total bald eagle flight minutes were recorded over two years of surveys, and bald eagles were often observed within the RSZ. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to bald eagles. Badger Wind has sited turbines at least 2 miles from the known bald eagle nest to reduce the risk of collision with turbines. Badger Wind

continues to coordinate with USFWS to avoid and minimize potential impacts to eagles to the extent practical.

Golden eagle (BGEPA and SCP II): Over the course of pre-construction eagle use studies, 12 golden eagle detections were recorded, including six observations during both year 1 and year 2 surveys (Atwell 2020c; Atwell 2021c). During year 1, observations occurred across the spring, fall, and winter, whereas in year 2, observations only occurred in fall and winter. Standardized observations refer to detections recorded during eagle use surveys. There was no apparent spatial pattern to golden eagle detections during year 1 or year 2 surveys. The 12 golden eagle sightings were distributed across the 2019 Study Area (Atwell 2020c; Atwell 2021c).

Indirect impacts to golden eagles due to habitat loss are not expected to occur throughout construction of the Project. Cumulatively, 47 total golden eagle flight minutes were recorded over two years of surveys, and golden eagles were often observed within the RSZ. While studies conducted in the western United States have shown golden eagles to be susceptible to collision mortality at wind farms (Smallwood and Thelander 2008), low observed mean use rates (12 observations over 1,272 hours of survey effort) suggest that golden eagle use of the Project Area is minimal. Tier 4 post-construction monitoring will provide more clarity regarding impacts to golden eagles. Badger Wind continues to coordinate with USFWS to avoid and minimize potential impacts to eagles to the extent practical.

5.3.2. North Dakota Avian Species of Conservation Priority

Several non-raptor species that are listed as North Dakota SCP were detected during 10-minute diurnal avian activity point count surveys or incidentally (Atwell 2020c; Atwell 2021c). These species are summarized below:

Non-Passerines and Passerines

Red-headed woodpecker (SCP Level I): One red-headed woodpecker (*Melanerpes erythrocephalus*) was observed over the course of two years of avian use surveys. This observation occurred on August 6, 2020 (year 2), at station 37. This species was detected within the 2019 Study Area incidentally on several occasions, typically in the fall during year 1 and year 2 surveys. Observations occurred exclusively at stations 37, 41, and 48, which are all in the southwestern portion of the 2019 Study Area. Red-headed woodpeckers prefer deciduous woodlots and may use shelterbelts within agricultural landscapes for breeding (Dyke et al. 2015). While nesting is possible within the Project Area, it is not anticipated that this species will be a common breeder or will experience significant impacts, given the presence of limited habitat and general lack of detections within the 2019 Study Area.

Sprague's pipit (SCP Level I): No spring detections and two fall detections were recorded incidentally and during year 2 avian use surveys. All observations occurred during fall migration, after July 28, 2020. Eleven of the 13 year 2 observations of individuals or groups occurred in the northern half of the 2019 Study Area, within Logan County. It was not apparent why more observations were recorded over the year 2 study period than during year 1, when Sprague's pipits were observed on only two occasions (also in the fall). Behaviors that would confirm local breeding

(e.g., song displays, nesting material carries, food carries to dependent young, dependent fledglings) were not observed during the 13 detections. Observations occurred in wheat stubble and on grassy hilltops, habitat features found throughout the 2019 Study Area. While nesting is possible within the Project Area, it is not anticipated that this species will be a common breeder or would experience significant impacts, given the general lack of detections within the 2019 Study Area. Furthermore, Badger Wind intends to minimize impacts to native grasslands to the greatest extent feasible.

Baird's sparrow (SCP Level I): Baird's sparrow (*Centronyx bairdii*) was not observed during avian use surveys. During year 1, two individuals were detected incidentally in May of 2019, one each at stations 3 and 53 in the northern and northeastern portions of the 2019 Study Area. This species prefers large, contiguous tracts of native prairie, though it will also use non-native grasslands and pastures (Dyke et al. 2015). Suitable nesting habitat may exist within the 2019 Study Area, particularly in the northern and northeastern portions, but the lack of observations over the course of two years of surveys indicates that breeding is unlikely and the observed individuals likely represented migrants. Therefore, this species is not likely to experience significant impacts as a result of the Project given the general lack of detections within the 2019 Study Area.

Grasshopper sparrow (SCP Level I): Four spring detections and one fall detection were recorded during year 1 avian use surveys, and four spring detections and zero fall detections were made during year 2 avian use surveys. Grasshopper sparrows were also incidentally observed at approximately 50 percent of point count stations during year 2, were observed throughout the 2019 Study Area, and were often associated with grassland habitats. Grasshopper sparrows were detected much more frequently during the summer survey period and likely breed within the Project Area. The majority of incidental observations occurred in June or July, which was outside of the spring and fall survey periods. Given this species' level of use of the 2019 Study Area and the presence of suitable habitat throughout much of the Project Area, development and operation of the Project may impact this species. Badger Wind intends to minimize impacts to native grasslands to the greatest extent feasible, though collisions with turbines are still possible. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to grasshopper sparrows.

Nelson's sparrow (SCP Level I): Nelson's sparrow was not observed during avian use surveys. During year 1, one individual was detected incidentally at station 6, and two detections (representing 1–2 individuals) occurred at station 37. During year 2, one individual was detected incidentally at station 37. This species prefers shallow marsh edges and wet meadows (Dyke et al. 2015) and may nest locally in appropriate habitats within the Project Area. Station 6 is near a riverine wetland that flows into Doyles Lake. Station 37 is near riverine wetland associated with a tributary of the south branch of Beaver Creek. Riparian areas north and west of Wishek may also support riverine wetlands that are favorable to this species. While nesting is possible within the Project Area, it is not anticipated that this species will be a common breeder or experience significant impacts, given the general lack of detections within the 2019 Study Area.

Chestnut-collared longspur (SCP Level I): In total, 22 spring detections and 11 fall detections occurred during year 1 avian use surveys, and 55 spring detections and 92 fall detections were made during year 2 avian use surveys. Chestnut-collared longspur were also incidentally observed

at 70 percent of point count stations in year 2. Over the year 1 study period, chestnut-collared longspur mean use rates were 0.14 detections/10-minute survey/150 m plot during the spring and 0.05 detections/10-minute survey/150 m plot during the fall. Over the year 2 study period, chestnut-collared longspur mean use rates were 0.35 detections/10-minute survey/300 m plot during the spring and 0.43 detections/10-minute survey/300 m plot during the fall. Males were frequently seen singing, and this species likely breeds within the Project Area. While observed throughout the 2019 Study Area, chestnut-collared longspurs were most frequently observed in the northern and northeastern portions of the 2019 Study Area that are higher in elevation and are dominated by herbaceous cover as shown in **Figure 2, Land Cover Types within the Project Area**. Given this species level of use of the 2019 Study Area and the presence of suitable habitat throughout much of the Project Area, development and operation of the Project may impact this species. Badger Wind intends to minimize impacts to native grasslands to the greatest extent feasible, though collisions with turbines are still possible. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to chestnut-collared longspurs.

Loggerhead shrike (SCP Level II): One incidental detection of loggerhead shrike (*Lanius ludovicianus*) occurred on April 17, 2021 (year 2), at station 30 in the central portion of the 2019 Study Area. This species was also detected incidentally in the summer while traveling between points during year 1 surveys, but no detections occurred during year 2. These observations likely represent migrating individuals. While nesting is possible within the Project Area, it is not anticipated that this species will be a common breeder or experience significant impacts, given the general lack of detections within the 2019 Study Area.

LeConte's sparrow (SCP Level II): LeConte's sparrow (*Ammospiza leconteii*) was not observed during avian use surveys; however, singing males were detected incidentally in July at stations 37 and 57 during year 2 avian use surveys. Stations 37 and 57 are near riverine wetlands associated with tributaries of Beaver Creek. The wet/riparian areas associated with station 57 are west and outside of the current Project Area. Similar to Nelson's sparrow, LeConte's sparrows may nest locally in and near riverine habitats similar to those within the Project Area. While nesting is possible within the Project Area, it is not anticipated that this species will be a common breeder or experience significant impacts, given the general lack of detections within the 2019 Study Area.

Dickcissel (SCP Level II): Dickcissels (*Spiza americana*) were not observed during avian use surveys during year 1 or year 2; however, this species was observed on multiple occasions throughout the 2019 Study Area during the summer season when surveys for small-bodied species did not take place. As such, this species is likely to breed within the 2019 Study Area. Dickcissel is a fairly common to uncommon species that will nest in a variety of grassland types, including hayfields and road ROW (Dyke et al. 2015). Given this species' level of use of the 2019 Study Area and presence of suitable habitat throughout much of the Project Area, development and operation of the Project may impact this species. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to Dickcissels.

Bobolink (SCP Level II): During year 1 surveys, bobolink was detected 11 times in the fall and 22 times in spring. During year 2 surveys, bobolink was detected 22 times in the fall and 30 times in spring. During year 2 surveys, bobolinks were incidentally observed at 98 percent of point count

stations in June and July, and dependent fledglings were observed in early August at station 32, confirming breeding. Bobolink mean use rates during year 1 surveys were 0.12 detections/10-minute survey/150 m plot in the spring and 0.02 detections/10-minute survey/150 m plot in the fall. Bobolink mean use rates during year 2 surveys were 0.14 detections/10-minute survey/300 m plot during both the spring and fall. Bobolink is a fairly common to abundant species that will use a variety of open habitats, including native grasslands, hayfields and pastures, old fields, and no-till cropland (Dyke et al. 2015). Given this species' level of use of the 2019 Study Area and presence of suitable habitat throughout much of the Project Area, development and operation of the Project may impact this species. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to bobolinks.

Western meadowlark (SCP Level II): In total, 66 spring detections and 22 fall detections of western meadowlark (*Sturnella neglecta*) were recorded during avian use surveys in year 1. In year 2, 171 spring detections and 114 fall detections of western meadowlark were recorded during avian use surveys. During year 2, western meadowlarks were incidentally observed at all point count stations in June and July. Western meadowlark mean use rates during year 1 were 0.42 detections/10-minute survey/150 m plot during the spring and 0.10 detections/10-minute survey/150 m plot during the fall. Western meadowlark mean use rates during year 2 were 1.08 detections/10-minute survey/300 m plot during the spring and 0.54 detections/10-minute survey/300 m plot during the fall. Western meadowlark is a common to uncommon species that prefers native grasslands but will also occur in hayfields, weedy fields, and within the grassy margins of croplands and roadsides (Davis and Lanyon 2008; Dyke et al. 2015). Given this species' level of use of the 2019 Study Area and presence of suitable habitat throughout much of the Project Area, development and operation of the Project may impact this species. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to western meadowlarks.

Shorebirds

Marbled godwit (SCP Level I): Four spring detections of five individuals and no fall detections of marbled godwit were made during year 1 avian use surveys. During year 2, seven spring detections of nine individuals and no fall detections of marbled godwit were made. During year 2, marbled godwits were observed incidentally at 19 percent of point count stations. Marbled godwits may nest within the Project Area in low numbers, but specific favored locations were not apparent during year 1 and year 2 surveys. During the year 1 study period, agitated behavior was recorded at station 16 on June 10, 2019, suggesting that a nest or brood was nearby. Breeding behaviors were not observed during year 2 surveys, and godwits were not observed at station 16 during the year 2 study period. Similarly, during year 2, agitated behavior was recorded at station 5 in the northern portion of the 2019 Study Area on June 11, 2021, suggesting that breeding was possible at a wetland west of the station. However, no marbled godwits were detected from this point count station during year 1 surveys. It is not anticipated that this species would experience significant impacts given the relatively low number of detections during avian use surveys; however, this species moves through the Project Area while migrating and foraging and may be at risk of collision with operational turbines. Breeding is likely within the Project Area and impacts to wetland habitat from project infrastructure may affect this species; however, Badger Wind has sited project

infrastructure to generally avoid wetlands. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to marbled godwits.

Wilson's phalarope (SCP Level I): Two detections of six Wilson's phalarope individuals were made during avian use surveys in year 1, and three detections of four individuals were made in year 2. Wilson's phalaropes were observed at stations 15 and 22 in both year 1 and year 2, suggesting that they may locally breed at some wetlands within the Project Area. It is not anticipated that this species will experience significant impacts given the limited number of detections during avian use surveys; however, breeding is likely within the Project Area, and impacts to wetland habitat would affect this species although, as previously mentioned, impacts to wetland habitat will be avoided to the extent feasible.

American avocet (SCP Level II): American avocets (*Recurvirostra americana*) were only observed incidentally during year 1 and year 2 avian use surveys at scattered locations throughout the 2019 Study Area, typically during the fall. One summer observation of four birds flying to the northeast occurred at station 5 in the northeastern portion of the Project. This species generally prefers to nest in sparsely vegetated areas on exposed shorelines of wetlands or lakes (Dyke et al. 2015). Nesting habitat for American avocets is more prevalent outside of the 2019 Study Area to the northeast; however, wetlands in the northeastern portion of the 2019 Study Area may provide suitable habitat as well. It is not anticipated that this species will experience significant impacts given the overall low number of detections (incidentals only) and the fact that breeding habitat appears limited within the Project Area. Construction of project infrastructure is also not anticipated in the vicinity of prairie potholes where breeding habitat is most prevalent.

Willet (SCP Level II): One willet was observed over the course of two years of avian use surveys. This observation occurred on May 15, 2020 (year 2), at station 52. This species was detected within the 2019 Study Area incidentally on multiple occasions throughout the spring, summer, and fall during year 1 and year 2 surveys. Most observations occurred in the northern and northeastern portions of the 2019 Study Area, particularly at stations 51, 52, and 53, which are located outside of the current Project Area boundary and contain the highest degree of suitable breeding habitat (i.e., large tracts of grassland habitat with adjacent shallow, wetland features with sparsely vegetated shoreline) (Dyke et al. 2015). However, one individual at station 7 (northern portion of the 2019 Study Area) appeared to display territorial behavior and may have been nesting nearby. Therefore, while breeding habitat primarily occurs outside of the 2019 Study Area to the northeast, limited suitable breeding habitat within the 2019 Study Area may support nesting willets. It is not anticipated that this species will experience significant impacts given that breeding habitat appears limited within the Project Area and construction of project infrastructure is not anticipated in the vicinity of prairie potholes where most detections of this species occurred.

Upland sandpiper (SCP Level II): During year 1 avian use surveys, 9 detections of 11 individual upland sandpipers were observed in the spring only. During year 2 avian use surveys, 26 detections of 34 individual upland sandpipers were observed in the spring and fall into mid-August of year 2. Upland sandpipers were detected at 36 percent of point count stations in year 2. Upland sandpipers likely nest in roadside habitats/ditches, grasslands, and cropland (particularly no-till) habitats throughout the 2019 Study Area. Given this species level of use of the 2019 Study Area and

presence of suitable habitat throughout much of the Project Area, development and operation of the Project may impact this species. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to upland sandpipers.

Waders

American bittern (SCP Level I): American bitterns nest in wetlands with tall emergent vegetation (Dyke et al. 2015), and one was observed vocalizing at a wetland near station 53 on May 15, 2020 (during year 2 surveys). Bitterns were not observed at this location on subsequent surveys, but individuals are difficult to detect from roadsides when silent and may nonetheless nest at this location. Station 53 is outside of the current Project Area boundary, though this species may nest in similar habitats within the current Project Area. American bitterns were also detected as incidental observations during year 1 surveys near station 52 (July 26, 2019; outside current Project Area boundary) and station 8 (August 28, 2019; adjacent to current Project Area boundary). It is not anticipated that this species will experience significant impacts given the overall low number of detections and the fact that breeding habitat appears limited within the Project Area. Construction of project infrastructure is not anticipated in areas where this species was detected, particularly in the vicinity of prairie potholes where breeding habitat is most prevalent.

Waterbirds

Horned grebe (SCP Level I): Horned grebe (*Podiceps auritus*) was only observed during avian use surveys in the spring and summer in year 1 at station 52. Station 52 is near several prairie potholes and is not within the current Project Area boundary. This species was also observed incidentally within the 2019 Study Area during the spring and summer in year 2 but not during surveys (i.e., while driving between survey points). It is not anticipated that this species will experience significant impacts given the general lack of detections within the 2019 Study Area. Construction of project infrastructure is not anticipated in the vicinity of prairie potholes where this species is most likely to breed.

American white pelican (SCP Level II): Two spring detections of 7 individuals and one fall detection of 21 individuals were recorded during year 1 avian use surveys for American white pelican (*Pelecanus erythrorhynchos*). Three spring detections of 62 individuals and one fall detection of two individuals were recorded during year 2 avian use surveys. American white pelicans were also incidentally observed in the spring, summer, and fall. Nesting colonies were not observed and are not known to exist within the 2019 Study Area. Flocks of up to 60 individuals were encountered at 20 of 53 point count stations (38 percent) throughout the 2019 Study Area during year 2 surveys. While breeding is not likely within the Project Area, this species can migrate through the Project Area in large numbers and may be at risk of collision with operational turbines. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to American white pelicans.

Black tern (SCP Level I): One fall detection of black tern occurred during year 1 avian use surveys, and five spring detections and one fall detection occurred during year 2 avian use surveys. This species was also observed on numerous occasions throughout the 2019 Study Area incidentally in the spring, summer, and fall. Black terns were generally observed in low numbers in the

northeastern portion of the 2019 Study Area in association with greater wetland density. Nesting colonies were not observed within the 2019 Study Area. While breeding is not likely within the Project Area, this species moves through the Project Area while migrating and foraging and may be at risk of collision with operational turbines. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to black terns.

Franklin's gull (SCP Level I): Franklin's gulls were observed flying through the 2019 Study Area more frequently in the fall than the spring over both the year 1 and year 2 study periods (year 1: 2 spring detections and 2,023 fall detections; year 2: 199 spring detections and 342 fall detections). There are no known Franklin's gull nesting colony sites within the 2019 Study Area, and fall detections appear to represent post-breeding movements from locations beyond the 2019 Study Area. Reasons for diminished numbers observed during the fall period in year 2 are unclear. During year 1, large flocks were found opportunistically foraging in agricultural habitats following harvesting and haying activities (e.g., single flock of 500 individuals observed on August 27, 2019). This is an expected observation for gulls moving in large numbers over agricultural cropland habitats, yet one not observed during surveys during the fall period in year 2. The observed decrease in fall Franklin's gull detections may have been due to chance. A large group of approximately 1,000 individuals was detected incidentally on September 22, 2020, at station 23, demonstrating the presence of Franklin's gull flocks during year 2 surveys. While breeding is not likely within the Project Area, this species moves through the Project Area while migrating and foraging and may be at risk of collision with operational turbines. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to Franklin's gulls.

Waterfowl

Northern Pintail (SCP Level II): A total of 109 spring detections of northern pintail were documented during year 1 avian use surveys. A total of 31 spring detections and five fall detections of northern pintail were documented during year 2 avian use surveys. Northern pintails were also observed at 66 percent of point count stations during the year 2 study period. Northern pintails were usually observed singly or in small groups of less than five individuals in wetlands and cropland habitats throughout the 2019 Study Area, though groups of up to 20 were occasionally observed. Pintail fledglings were not noted during year 1 or year 2 surveys, but this species may nest near wetland complexes in associated prairie habitats. While breeding has not been confirmed within the Project Area, this species is relatively common and moves through the Project Area while migrating and foraging. Therefore, it may be at risk of collision with operational turbines. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to northern pintail.

Canvasback (SCP Level II): Four canvasback were observed during year 1 surveys, and two canvasback were observed during year 2 surveys. All four individuals detected during year 1 surveys were at station 16 in the western portion of the 2019 Study Area in early April. Both year 2 observations occurred in the northeastern portion of the 2019 Study Area at stations 5 and 53 in May. No evidence of breeding within the 2019 Study Area was observed. It is not anticipated that this species will experience significant impacts given the general lack of detections within the 2019 Study Area. Construction of project infrastructure is not anticipated in the vicinity of prairie potholes where this species is most likely to breed.

Lesser Scaup (SCP Level II): Five lesser scaup were observed during year 1 surveys. All five individuals were observed in the northeastern portion of the 2019 Study Area at stations 5 and 53 in May. This species was also observed incidentally in the summer during year 1 surveys. During year 2 surveys, lesser scaup were only observed incidentally in the northeastern portion of the 2019 Study Area in spring and summer. It is not anticipated that this species will experience significant impacts given the general lack of detections within the 2019 Study Area. Construction of project infrastructure is not anticipated in the vicinity of prairie potholes where this species is most likely to breed.

Prairie Grouse (Sharp-tailed Grouse)

One confirmed sharp-tailed grouse lek location and two possible lek locations were observed within the grouse survey area during the year 1 grouse lek surveys. All three lek locations were along the edge of the 2019 Study Area boundary (**Figure 7, Avian Resources**) (Atwell 2020c).

Thirteen confirmed sharp-tailed grouse lek locations and two possible lek locations were found within the grouse survey area through a combination of aerial and ground-based efforts during the year 2 lek survey (**Figure 7, Avian Resources**). The same area was surveyed in 2019 and 2020, which included the 2019 Study Area and a surrounding 1-mile survey buffer (Atwell 2021c).

Two confirmed lek locations were observed within the current Project Area boundary, four confirmed and one possible lek location were observed within 1 mile of the current Project Area boundary, and seven confirmed and one possible lek location were observed beyond the current Project Area's 1-mile buffer (**Figure 7, Avian Resources**). Confirmed leks held 4 to 27 individuals (Atwell 2021c). Confirmed and possible leks are depicted in **Figure 7, Avian Resources** with 0.5-mile-radius buffers to represent likely nesting areas for females (Dyke et al. 2015).

During year 1 diurnal avian activity surveys, 38 sharp-tailed grouse were detected: 32 in the spring and six in the fall. This resulted in a mean use of 0.20 detections/10-minute survey/800-m plot in the spring and 0.03 detections/10-minute survey/800-m plot in the fall. During year 2 diurnal avian activity surveys, 18 sharp-tailed grouse were detected: 9 in the spring and 9 in the fall. This resulted in a mean use of 0.06 detections/10-minute survey/800 m plot in the spring and 0.04 detections/10-minute survey/800 m plot in the fall (Atwell 2020c; Atwell 2021c).

It is not anticipated that this species will experience significant impacts. While this species is relatively common within the 2019 Study Area, sharp-tailed grouse tend to remain below RSZ. Also, wind turbines were sited within agricultural areas and a 1-mile buffer was established for leks to the extent feasible to limit potential impacts to sharp-tailed grouse lek and nesting habitat. This species may experience impacts via displacement (Shaffer and Buhl 2016). However, Badger Wind intends to avoid siting wind turbines within native grasslands to the greatest extent feasible, thereby reducing displacement impacts.

Nesting Raptor Species

The 2019 Study Area was surveyed for nesting raptors in May 2019 and April and May 2020 via aerial and ground-based surveys. Nests of the following non-eagle raptor species were identified

within the raptor nest survey area during the 2019 survey (**Figure 8a, Year 1 Eagle and Raptor Nest Survey Results**): ferruginous hawk ($n=5$), red-tailed hawk ($n=4$), great horned owl (*Bubo virginianus*; $n=2$), Swainson's Hawk ($n=1$), and unknown raptor ($n=1$) (Atwell 2020c; Atwell 2021c). Non-eagle raptor nests identified during the 2020 eagle and raptor nest survey that are within the current Project Area boundary and a surrounding 2-mile buffer (**Figure 8b, Year 2 Eagle and Raptor Nest Survey Results**) include red-tailed hawk ($n=8$), great horned owl ($n=5$), ferruginous hawk ($n=4$; a fifth occupied nest was found in May 2021), Swainson's hawk ($n=4$), and unknown raptor ($n=9$; two additional nests were found in May 2021).

Of the non-eagle nests located during year 1 studies, three ferruginous hawk nests, three red-tailed hawk nests, one Swainson's hawk nest, one great horned owl nest, and one unknown raptor species nest were found within the 2019 Study Area boundary. Of the nests located during year 2 studies and 2021 micro-siting activities, one bald eagle nest, one great horned owl nest, one red-tailed hawk nest, one Swainson's hawk nest, and six unknown raptor nests were found within the current Project Area boundary. Recommended setbacks to raptor nests were used to assist with siting project infrastructure.

Non-eagle raptor species of concern observed within the 2019 Study Area during Tier 3 field studies included American kestrel (*Falco sparverius*; SCP Level II), burrowing owl (*Athene cunicularia*; SCP Level II), ferruginous hawk (SCP Level I), northern harrier (SCP Level II), peregrine falcon (*Falco peregrinus*; SCP Level III), prairie falcon (*Falco mexicanus*; SCP Level II), and Swainson's hawk (SCP Level I). Standardized observations of peregrine falcon and prairie falcon were relatively infrequent, and burrowing owl was only detected once incidentally within the 2019 Study Area while traveling between point count stations. These species are likely uncommon migrants through the Project Area, and significant impacts from project operation are not anticipated.

Raptor mean use recorded during avian use surveys was primarily driven by detections of red-tailed hawks, Swainson's hawks, and northern harriers. During year 1, these species collectively accounted for approximately 68 percent of raptor detections in the spring season and 82 percent of detections in the fall season (Atwell 2020c). During year 2, these species collectively accounted for approximately 66 percent of raptor detections in the spring season and about 65 percent of detections in the fall (Atwell 2021c). Ferruginous hawks accounted for approximately 4.5 percent of raptor detections in the spring and about 0.7 percent of detections in the fall of year 1 surveys, and approximately 4.9 percent of detections in spring of year 2 surveys. No ferruginous hawks were detected during the fall year 2 surveys. American kestrels accounted for approximately 4.5 percent of raptor detections during spring and approximately 2.2 percent of detections in the fall of year 1 surveys. During year 2 surveys American kestrels represented about 7.3 percent of raptor detections in the spring and 5.5 percent of detections in the fall (Atwell 2020c; Atwell 2021c).

In particular, red-tailed hawks, Swainson's hawks, and ferruginous hawks are often found within the RSZ, though northern harriers and American kestrels tend to fly below the RSZ (Atwell 2020c; Atwell 2021c). These species may be at relatively higher risk because of their level of use of the 2019 Study Area; however, measures taken to avoid and minimize potential impacts of the Project to non-cultivated habitat along with proposed measures to avoid and minimize potential impacts, including establishing species-specific raptor nest buffers for wind turbines, are expected to reduce

this risk, and population-level impacts are not expected when accounting for these measures. Collisions with project infrastructure may occur, though population-level risk is not anticipated.

5.3.3. ESA- Listed Bat Species

Northern long-eared bat (Threatened): Tier 1 and 2 studies found that ESA-listed threatened northern long-eared bats could occur within the 2019 Study Area. However, the Project is located outside of the core range for northern long-eared bats. Acoustic monitoring was conducted in 2019 and 2020 at one MET tower location, and some ground-based monitoring was conducted in the vicinity of woodlot patches. Northern long-eared bats were not detected during acoustic monitoring in 2019 and 2020 (Atwell 2020b; Atwell 2021b), though unknown *Myotis* species calls were detected. While the potential for these calls to be attributed to northern long-eared bats could not be ruled out, there was not a sufficient number of pulse calls to attribute these calls to species.

Badger Wind considered establishing 1,000-foot buffers from all woodland patches greater than 10 acres in size, which is a standard practice for minimizing potential impacts associated with potential roost habitat for projects located outside of core range for northern long-eared bats. The habitat assessment indicated, as previously mentioned, that potential roosting habitat is highly fragmented and found that no woodland patches were greater than 10 acres. It is noted, however, that that majority of wind turbines are sited at least 1,000 feet from smaller, fragmented woodlot patches (**Figure 6, Bat Resources**).

Given that the Project is located outside of core range, that summer roosting habitat for this species is highly fragmented within the Project Area, that direct and indirect impacts to woodlots will generally be avoided, and that Tier 3 studies did not confirm use by this species within the 2019 Study Area, the Project is not expected to pose notable risk to northern long-eared bats. Operation of the Project is not expected to result in take of northern long-eared bats over the lifespan of the Project. Most wind turbines are located at least 1,000 feet from the smaller, fragmented woodlots that are present in the Project Area, and direct disturbance to woodlots with trees that contain potential roost trees (snags with diameter at breast height greater than 3 inches and exfoliating bark/cavities) will be avoided to the extent feasible. Any unavoidable tree removal that may occur within the Project Area will follow guidelines in accordance with the 4(d) rule for northern long-eared bat, as presented in **Section 6.2**. Once construction is complete, no further loss of summer bat habitat due to project activities is expected to occur for the remainder of the 30-year life of the Project. Tier 4 post-construction monitoring will also provide more clarity regarding any impacts to northern long-eared bats.

5.3.4. North Dakota Bat Species of Conservation Priority

Big brown bat (SCP Level I): Due to similarities in call signatures between big brown bat and silver-haired bat (non-SCP), these two species were grouped during acoustic analysis. This group had the highest frequency of bat calls (485 calls; 42.8 percent of bat calls) during year 2 studies and the second highest frequency of bat calls during year 1 studies (757 calls; 37.3 percent of bat calls). Big brown bat/silver-haired bat activity was detected at all acoustic monitoring stations during year 1 and year 2 surveys. While peaks in activity during spring and fall are likely attributable to silver-

haired bat activity, which are not year-round residents in the 2019 Study Area, summer activity is likely from big brown bats as they are year-round residents throughout North Dakota (Atwell 2020b; Atwell 2021b). Big brown bat mortality is possible as a result of project operation, particularly during migration or summer periods; however, it is expected to reflect the national trends of mortality for this species (Arnett and Baerwald 2013; Allison 2018; AWWI 2018), and no population-level effects are expected to occur as a result of project operation.

To reduce the risk of turbine collision to bat species, Badger Wind established a 1,000-foot forest buffer around suitable bat habitat. The number of turbines within this forest buffer will be reduced to the extent feasible, and tree clearing of suitable bat habitat is expected to be minimal. Any proposed tree clearing will follow guidelines presented in **Section 6.2**. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to big brown bats.

Little brown bat (SCP Level I): Little brown bats were infrequently detected during Tier 3 acoustic monitoring studies. In total, four calls (0.2 percent of bat calls) attributed to this species were recorded during year 1 studies, and three calls (0.3 percent of bat calls) were recorded during year 2 studies. Calls were recorded at acoustic monitoring stations BMg1 (south of the current Project Area boundary) and BMg2 (in the southern portion of the current Project Area boundary) in year 1. In year 2, calls were recorded at acoustic monitoring stations BMg1 (in the northeastern portion of the current Project Area boundary), BMg2 (same location as year 1), and BMg3 (same location as BMg1 in year 1) (**Figure 6, Bat Resources**) (Atwell 2020b; Atwell 2021b). Little brown bat mortality due to project operation is possible, particularly during migration or summer periods; however, it is expected to reflect the relatively low national trends of mortality for this species (Arnett and Baerwald 2013; Allison 2018; AWWI 2018), and no population-level effects are expected to occur as a result of project operation.

As previously mentioned, to reduce the risk of turbine collision to bat species, Badger Wind will avoid direct impacts to bat habitat to the extent feasible. The number of turbines located near woodlots has been limited to the extent feasible, and tree clearing of suitable bat habitat and specifically removal of potential roost trees is expected to be minimal. Any proposed tree clearing will follow guidelines presented in **Section 6.2**. Tier 4 post-construction monitoring will provide more clarity regarding any impacts to little brown bats.

5.4. Question 5 and Response

How can developers mitigate identified significant adverse impacts?

Badger Wind is voluntarily adhering to guidance included in the WEG, ECPG, and 2016 Eagle Rule revision to minimize potential effects from the Project on birds and bats through development and implementation of this BBCS. A Critical Issues Analysis and agency coordination were used to inform Tier 3 study design. Results from Tier 3 studies and agency coordination were then used to develop and refine the Project Area boundary and locations of project infrastructure. The Project was designed to avoid and minimize use of high-quality habitat and/or areas that may be suitable for TES and other sensitive species of concern to the greatest extent feasible. Badger Wind intends to site most infrastructure in locations that are predominantly agricultural and lack large tracts of

contiguous woodland habitat; such areas generally do not include conservation areas where development is precluded by law.

Placement of turbines and associated infrastructure within large tracts of grassland may result in the displacement of some grassland bird species (Shaffer and Buhl 2016). Badger Wind has conducted field verification of grassland habitat conditions to refine understanding of areas defined by NDGF as unbroken that have been converted to agricultural use (WEST 2021). Badger Wind has used the results of this study, in coordination with USFWS and NDGF to design a project layout that minimizes potential impacts to unbroken grasslands. Badger Wind is also coordinating with USFWS and NDGF to determine potential voluntary offsets for indirect impacts to grassland species. The results of this analysis will help to guide additional conservation measures that can be implemented such as the preservation of existing grassland habitat or creation of new habitat that can support grassland bird species.

Approximately 1,453.7 acres (approximately 4.6 percent of the Project Area) will be disturbed during construction, with approximately 1,361.4 acres of temporary disturbance that will be reclaimed, and a permanent disturbance footprint of 92.3 acres. Badger Wind has employed avoidance and minimization strategies to mitigate minor temporary and permanent impacts as well as identified potential impacts to potential breeding and roosting habitat for birds and bats. These include, but are not limited to, re-siting several construction access roads and turbines to be located outside non-cultivated areas to the extent practical, establishing setback buffers for raptor nests, and minimizing tree removal. Additional measures employed to avoid and reduce impacts are further discussed in **Section 6** of this BBCS.

5.5. Question 6 and Response

Are there studies that should be initiated at this stage that would be continued in post-construction?

Other than those studies conducted adhering to the WEG, no other Tier 3 studies are proposed at this time. While the Project is not likely to have significant impacts to species of concern based on Tier 1, 2, and 3 analyses, the Project will conduct post-construction avian and bat mortality monitoring for at least one year following construction and adhering to the WEG. Post-construction surveys will serve to estimate mortality rates of birds and bats for the Project to further assess potential impacts and validate the efficacy of avoidance, minimization, and mitigation measures. Tier 4 monitoring methods are summarized in **Section 7.1**.

5.6. Tier 3 Decision Point

Tier 3 analyses indicate that the Project presents a low to moderate risk to TES and other sensitive species of concern. Grassland bird species may be impacted if turbine infrastructure is placed within grassland habitat; however, Badger Wind proposes to minimize impacts to native grasslands to the extent feasible and mitigate for unavoidable impacts through the use of a biodiversity offset. Badger Wind has decided to voluntarily proceed to Tier 4 surveys per WEG recommendations to further assess potential impacts to birds and bats and validate the efficacy of avoidance, minimization, and mitigation measures. Mortality monitoring will be based upon USFWS and NDGF

recommendations and industry standards. **Table 4** summarizes specific Tier 3 results and Badger Wind's decision to continue with further Tier 4 studies and analysis.

Table 4. WEG Tier 3 Decision Analysis per Ecological Constraint

Species/Resource	Resource Constraints within the Project Area	Status of Resource Constraint within the Project Area	Tier 3 Decision Point	Direct Impact Avoidance	Tier 4 Analysis Procedure
Avian Resources					
Grasslands	Presence of herbaceous grassland habitat through Tier 2 land-cover analysis (e.g., Figure 2).	Present as contiguous grassland parcels, particularly within the northern and northeastern portions of the 2019 Study Area.	Proceed to Tier 4b through assessment of resource impact to specific wildlife species. Proceed to Tier 4a to help validate predictions about likely minimal direct impacts to grassland avian species.	Avoid operational infrastructure development within grassland habitat to greatest extent feasible; implement habitat mitigation protocols including voluntary offsets for impacts to native prairie.	Incorporate avoidance and minimization measures for herbaceous grassland into BBCS; Preliminary Post-Construction Fatality Monitoring; revision of BBCS, as needed.
Whooping Crane	Project is within 75 percent migration corridor for this species. Stopover habitat quantity and quality generally lower than reference areas.	Rare. One incidental detection of four whooping cranes.	Proceed to Tier 4a to help validate predictions about likely minimal direct impacts to the species. Conduct post-construction mortality monitoring and build adaptive response.	Avoid operational infrastructure development near high-quality stopover habitat to greatest extent feasible; Adhere to APLIC guidelines.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed. Badger Wind will also develop a Whooping Crane Contingency Plan that outlines measures to be taken in the event that whooping cranes are observed in the project vicinity during operations.

Species/Resource	Resource Constraints within the Project Area	Status of Resource Constraint within the Project Area	Tier 3 Decision Point	Direct Impact Avoidance	Tier 4 Analysis Procedure
Bald Eagle	Primarily spring and fall use of Project Area, with less summer and winter use. One known nest within the Project Area.	Uncommon to rare seasonally. One in-use nest within Project Area.	Proceed to Tier 4a to help validate predictions about likely minimal direct impacts to the species. Conduct post-construction mortality monitoring and build adaptive response.	Situating Project to avoid construction of turbines within 2 miles of known eagle nest.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed. Badger Wind continues to coordinate with USFWS to avoid and minimize potential impacts to eagles to the extent practical.
Golden Eagle	Primarily fall and spring use of Project Area. Not likely to breed within Project Area.	Relatively rare within the Project Area, but occurrence in small numbers likely regular.	Proceed to Tier 4a to help validate predictions about likely minimal direct impacts to the species. Conduct post-construction mortality monitoring and build adaptive response.	Situating project operational infrastructure to avoid potential foraging habitat.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed.

Species/Resource	Resource Constraints within the Project Area	Status of Resource Constraint within the Project Area	Tier 3 Decision Point	Direct Impact Avoidance	Tier 4 Analysis Procedure
Other Nesting Raptors (including North Dakota SCP)	Known nesting raptors within Project Area, primarily red-tailed hawks, ferruginous hawks, Swainson's hawks and great horned owls.	Uncommon and sparsely distributed within isolated woodlots.	Proceed to Tier 4a to help validate predictions about likely minimal direct impacts to the species. Conduct post-construction mortality monitoring and build adaptive response.	Site wind turbines away from known nests. Review on case-by-case basis if woodland habitat is proposed for removal. Site infrastructure outside of recommended nest setback buffers. Monitor nests for disturbance during construction when timeline overlaps with nesting season.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed.
North Dakota Avian Species of Conservation Priority	Thirty-two avian SCP detected within the 2019 Study Area during Tier 3 surveys and incidentally (excluding species list above). Primarily grassland and wetland species.	Rare to common within the Project Area, depending on species and time of year. Many are likely breeders, particularly in the northern and northeastern portions of the Project Area.	Proceed to Tier 4a to help validate predictions about likely minimal direct impacts to the species. Conduct post-construction mortality monitoring and build adaptive response.	Avoid operational infrastructure development within grasslands and wetlands to greatest extent feasible.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed.

Species/Resource	Resource Constraints within the Project Area	Status of Resource Constraint within the Project Area	Tier 3 Decision Point	Direct Impact Avoidance	Tier 4 Analysis Procedure
Bat Resources					
Deciduous Woodland	Presence of some deciduous woodland (about 0.2 percent of total Project Area acreage).	Few isolated deciduous woodlots and shelterbelts scattered throughout Project Area; largest woodlots in southern portion of Project Area.	No need to proceed to Tier 4b through assessment of resource impact to specific wildlife species. Bat impacts already assessed in Tier 2.	Adhere to 4(d) rule; avoid forested habitat removal during June through July; avoid siting infrastructure in the vicinity of potential bat habitat. Avoid tree removal and specifically removal of potential roost trees to extent feasible.	Incorporate avoidance and minimization measures for deciduous woodland into BBCS. In cases where tree removal cannot be avoided, 4(d) rule would inform tree removal. Revision of BBCS, as needed.
Northern long-eared bat	Potential migration through project airspace; summer roosting possible but not likely.	Not confirmed during Tier 3 field studies.	Proceed to Tier 4a to validate predictions of low impacts from operation of the Project and efficacy of avoidance and minimization measures. The 4(d) rule would apply in this development scenario.	Adhere to 4(d) rule; avoid forested habitat removal during June through July; avoid siting infrastructure in the vicinity of potential bat habitat. Avoid tree removal and specifically removal of potential roost trees to extent feasible.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed.

Species/Resource	Resource Constraints within the Project Area	Status of Resource Constraint within the Project Area	Tier 3 Decision Point	Direct Impact Avoidance	Tier 4 Analysis Procedure
North Dakota bat Species of Conservation Priority	Potential use of project air space while foraging or migrating.	Little brown bat confirmed during Tier 3 acoustic studies. Big brown bat likely present but difficult to separate calls from silver-haired bat (not SCP).	Proceed to Tier 4a to validate predictions of low impacts from operation of the Project and efficacy of avoidance and minimization measures. The 4(d) rule would apply in this development scenario.	Adhere to 4(d) rule; avoid forested habitat removal during June through July; avoid siting infrastructure in the vicinity of potential bat habitat. Avoid tree removal and specifically removal of potential roost trees to extent feasible.	Conduct preliminary post-construction fatality monitoring; revision of BBCS, as needed.

6. FACILITY DESIGN TO REDUCE WILDLIFE CONFLICT

6.1. Project Facilities Design and Consideration

6.1.1. Turbine Locations and Design

The project layout includes 74 primary and 5 alternate WTG locations. Turbines are primarily sited within upland and agricultural portions of the Project Area. The WTG site layout has been configured to avoid areas with higher documented use by raptors and other species of wildlife protected under the ESA, BGEPA, and MBTA, to the extent feasible. Habitat that was identified as potentially suitable for species of concern was also avoided to the maximum extent feasible when siting the Project. The Project will also use state-of-the-art wind turbines, which yield more megawatts per turbine, resulting in a lower number of turbines on the landscape to achieve the same level of electricity production. In addition, un-guyed tubular towers will be used for the Project wind turbines, which are documented to lower the potential for raptor and other bird collisions (Gehring et al. 2009). Bird flight diverters will be installed in the event that guyed MET towers are used for the Project.

6.1.2. Facilities

The Project's associated facilities will be sited and designed to avoid and reduce potential impacts to birds and bats, and the collection and communication system will be buried underground in accordance with industry standards. Impacts of these systems on birds and bats will be eliminated since they are underground. The Project Area and associated project infrastructure will be primarily located within cultivated agriculture areas, thereby minimizing project-related land disturbance of habitat for sensitive species. New land disturbance will be limited to the extent feasible. The existing road system will be utilized to the maximum extent feasible, thereby reducing additional land disturbance. Newly constructed access roads will be placed along section lines, within agricultural fields, and outside of wetlands and waterbodies to the extent practicable to reduce habitat fragmentation. The short (0.75-mile) overhead transmission line will be located primarily within agricultural upland habitat. Some wetlands and small forested patches will be encountered along the route; pole placement in wetlands will be avoided to the extent possible. The transmission line will parallel existing roadways and transmission lines for large portions of the route, thereby helping to reduce additional disturbance to bird and bat habitat. Furthermore, the transmission line will be designed to APLIC standards, including the use of avian flight diverters, in order to reduce the risk of electrocution and collision to birds.

6.1.3. Lighting

Wind Turbines: The Project will comply with Federal Aviation Administration (FAA) guidelines. Gehring et al. (2009) reported that flashing red lights attract much lower numbers of nocturnal migrants compared to steady red lights and, in turn, should reduce avian and bat fatalities. The FAA recently amended its recommended lighting standards for wind facilities to follow this recommendation of utilizing flashing red lights in an effort to reduce the potential impacts to migratory species (FAA 2015), and the Project will comply with this standard. Furthermore, the

Project will utilize an Aircraft Detection Lighting System (ADLS), which will turn on lights when and aircraft is in proximity to the Project. As such, the amount of time lights are on will be reduced, thereby reducing the potential for lighting to attract birds.

Project Facilities: Lighting of ancillary structures will be minimized and downward-facing lights and/or motion-sensing lights will be installed, as practicable, to minimize attracting birds/bats. This approach to lighting should further minimize the attractiveness of the Project Area to nocturnal avian and bat migrants and thus reduce bird and bat mortalities (Gehring et al. 2009).

6.2. Specific Avoidance and Minimization Measures

The following measures will be implemented to avoid and minimize potential impacts to birds and bats:

- **Electrocution**
 - APLIC best practices will be followed to reduce potential for electrocution and collision.
 - Electrical collection lines will be buried.
- **Collision**
 - Tubular wind turbine towers will be used (not lattice towers) to minimize perching opportunities.
 - All guy wires on MET towers (if applicable) and aboveground transmission lines will be marked with avian flight diverters.
 - Wind turbine and MET tower lighting will comply with FAA requirements, including use of an FAA-approved ADLS, which will activate lights when an aircraft is detected in the vicinity of the Project. As such lighting that may attract birds will be reduced. Lighting of ancillary structures will be minimized and downward-facing lights and/or motion-sensing lights will be installed, as practicable, to minimize attracting birds/bats.
- **Habitat Loss**
 - Surface disturbance footprints will be limited to the extent feasible to minimize habitat disturbance.
 - Existing roads will be used wherever possible.
 - Badger Wind has voluntarily implemented the following avoidance and minimization measures for unbroken grasslands

- Results of the grassland field verification study (WEST 2021) were used to evaluate and inform project infrastructure siting decisions to avoid and minimize potential impacts to unbroken grassland habitat.
- The Project Area was revised to avoid large areas of intact unbroken grasslands.
- Focused leasing efforts on more actively managed agricultural lands.
- Placed access roads along section lines and within agricultural fields, to the extent practicable, to minimize further fragmentation.
- Sited the majority of wind turbines within agricultural lands.
- Access roads have been sited outside of wetlands and waterbodies to the extent feasible. Where impacts are unavoidable, potential impacts to potential wildlife habitat, wetlands, and forested areas will be limited to the extent feasible.
- Impacts to jurisdictional wetlands and waters will be limited to the maximum extent feasible.
- The final site plan for the Project will exclude all WMAs, WPAs, PLOTs, and other protected federal and state lands.
- The final site plan for the Project will avoid protected USFWS easements, including wetland and grassland easements. Coordination with the USFWS Kulm Office is ongoing.
- Badger Wind is coordinating with USFWS and NDGF on potential offsets.
- A Stormwater Pollution Prevention Plan will be developed and implemented to limit potential for erosion-related impacts to wildlife or sensitive habitats.
- Tree Removal
 - Removal of trees will be avoided to the extent feasible.
 - As appropriate, wooded areas will be checked for potential bat roosts prior to disturbance. If northern long-eared bat (NLEB) presence is detected, the following voluntary measures will be undertaken by Badger Wind in accordance with the USFWS 4(d) rule:
 - Tree removal can occur at distances greater than 0.25 miles (0.4 km) from a known, occupied hibernaculum.
 - Tree removal will avoid cutting or destroying known, occupied roost trees during the pup season (June 1 – July 31).

- Tree removal will avoid clear-cuts (and similar harvest methods – e.g., seed tree, shelterwood, and coppice) within 0.25 miles (0.4 km) of a known, occupied roost tree during the pup season (June 1 – July 31).
- Construction Measures
 - As appropriate, areas will be checked for nests and potential bat roosts prior to disturbance and/or surface disturbance, and tree removal will be completed outside the nesting season.
 - The following measures will be implemented to avoid and minimize potential impacts to sharp-tailed grouse leks:
 - Badger Wind has voluntarily sited all wind turbines away from known sharp-tailed grouse leks and within previously fragmented areas in coordination with USFWS and NDGF.
 - The above-ground transmission line was not sited within one mile of sharp-tailed grouse leks, to the extent practical.
 - The area disturbed for siting and construction activities will be minimized to the extent practical.
 - Off-road travel will be minimized and on-site speed limits on roads will be implemented
 - The following measures will be implemented to avoid and minimize potential impacts to nests:
 - Direct impacts to bird nests will be avoided to the extent feasible.
 - Roads and laydown areas will be located in previously disturbed areas, such as cultivated agricultural areas, to the extent practical.
 - Wind turbines were sited at least two miles from eagle nests and 0.25 mile from identified active, occupied raptor nests to the extent practical.
 - Construction activities will be limited in the vicinity of raptor nests during the construction season to the extent practical.
 - Construction activities will be initiated prior to the raptor nesting season, to the extent practical.
 - In cases where construction activity occurs in proximity to active nests, the nest activity will be monitored during the nesting season by a qualified biologist.
 - Where turbines cannot be sited away from a raptor nest, Badger Wind will consult with USFWS and NDGF to determine appropriate mitigation measures,

including potentially removing or relocating the nest outside of the nesting season.

- If a whooping crane is sighted in the Project Area during construction, construction will stop within one mile until the whooping crane has left the area.
- Temporary disturbance areas will be reclaimed, fertilized, and reseeded according to Natural Resource Conservation Service recommendations, unless otherwise specified by the landowner and approved by the North Dakota Public Service Commission, as detailed in the Badger Wind Reclamation and Weed Management Plan.
- Construction/Operational Measures
 - All contractors and sub-contractors will be required to attend wildlife awareness training.
 - Vehicles will be limited to roads or specific construction paths and will adhere to established on-site speed limits.
 - Good housekeeping measures will be implemented during the construction period and over the operational life of the Project (e.g., collection and disposal of trash, debris, and limiting unharvested crops, as feasible).
 - Wildlife carrion and/or roadkill identified by operations and maintenance (O&M) staff within the project footprint will be promptly removed and disposed of to avoid attracting scavenger wildlife or prey species.
 - Noxious weeds will be managed in accordance with applicable regulations and the Badger Wind Reclamation and Noxious Weed Management Plan.
 - Pesticide, herbicide, fertilizer, and other chemical treatments will be used in accordance with federal and state regulations and laws to minimize drift and other potential impacts on native habitat.
 - A Spill Prevention, Control, and Countermeasure (SPCC) Plan will be developed to outline spill response/containment and clean up procedures.
 - Post-Construction Mortality Monitoring (PCMM) will be conducted for at least one-year after construction. The PCMM program will include searches for bird and bat carcasses and will correct for potential searcher efficiency and carcass removal biases.
 - An adaptive management program will be implemented in accordance with this BBCS.

This BBCS is considered a living document and will be updated over the operational life of the Project as deemed necessary.

6.3. Bird and Bat Conservation Strategy

As part of due diligence efforts and the adaptive management program Badger Wind is implementing for the Project, this BBCS has been developed to document the studies completed to help understand potential risk to avian and bat species from the Project and measures to avoid and minimize these potential impacts, including conservation strategies that will be implemented over the life of the Project. The BBCS outlines the progression of the Project from the preliminary due diligence phases of site assessment through the field studies and discusses minimization measures implemented by Badger Wind based on the results of the Tier 1 desktop analysis through Tier 3 field studies. Tier 4 studies (**Section 7**) will be used to evaluate the efficacy of avoidance and minimization measures designed to limit potential impacts to birds and bats. This document is considered a living document and will be updated as deemed necessary.

7. TIER 4—POST-CONSTRUCTION STUDIES TO ESTIMATE IMPACTS

To substantiate the findings of the Tier 1 through Tier 3 assessment process, Badger Wind proposes to conduct PCMM studies, following completion of construction, to assess risk and estimate impacts to avian and bat species, including TES and other species of concern. The Tier 4 PCMM study design will incorporate guidelines presented in the USFWS Land-based WEG (USFWS 2012).

7.1. Monitoring Methods

Once the Project is operational, PCMM studies will be conducted for one year, as follows:

- Searches for birds and bats will occur in the spring, summer, and fall.
- Searches will occur on roads and pads at 33 percent of project turbines.
- Mortality rates will be calculated for both birds and bats on a per megawatt and per turbine basis, accounting for potential searcher efficiency and carcass removal biases.

Importantly, the complex task of determining fatality rate estimates will follow a rigorous approach to provide the best possible data for calculating these statistics. An annual report will be compiled upon completion of the mortality monitoring study. Items discussed will include:

- Standardized carcass searches of search plots at selected turbines.
- Combined searcher efficiency and carcass removal/persistence bias trials to estimate the probability that a carcass was available to be detected.

Estimates of project-related fatalities will be based on:

- Latest available estimator models (e.g., Generalized Mortality Estimator) (Dalthorp et al. 2018).
- Observed number of carcasses found during searches within the monitoring survey period for which the cause of death is either unknown or is probably project related.
- Measured rates of availability and detectability (by taxa size class).
- Area searched.

Generalized Mortality Estimator (GenEst) software (Dalthorp et al. 2018) or other appropriate estimator will be used to calculate estimates.

7.2. Reporting Mechanisms

The proposed avian and bat mortality monitoring studies will follow parameters set forth within a study plan completed prior to the start of monitoring. An annual report will be compiled detailing findings for the current year's mortality study. The annual report will be shared with the USFWS and NDGF and Badger Wind will coordinate with these agencies to determine if adaptive

management measures are warranted. Should operations staff or contractors confirm fatality of a species protected under the ESA or BGEPA, USFWS and NDGF will be notified within 24 hours. Key contacts for reporting avian and bat wildlife incidents, if applicable, are included in **Appendix C**.

7.3. Adaptive Management

This BBCS addresses the potential for “*significant adverse impacts*” (i.e., USFWS 2012) to species of concern and their habitats. Potential significant adverse impacts to a broad spectrum of wildlife resources have not been identified as a possible outcome of developing and operating the Project, and this BBCS was created to provide an efficient means of navigating through project operations. If significant adverse impacts are found to have occurred, adaptive management measures may be used to develop new measures to avoid, minimize, and mitigate these impacts and to monitor the efficacy of these measures. Federal and state wildlife agencies have not set potential impact threshold scenarios (e.g., species group per-megawatt collision mortality thresholds) that would qualify as significant adverse impacts in this region of North Dakota. However, certain scenarios, such as the discovery of a new eagle nest within the Project Area or the discovery of a fatality confirmed to be an ESA-listed TES or eagle species, will trigger agency coordination to assess whether adaptive management responses are warranted.

Similarly, population-level bird and bat effects and significant avian-bat mortality events (e.g., “mass mortality events”) at the Project are not expected based on the analysis of Tier 3 study data as presented within this BBCS. A certain level of avian-bat fatality is expected at any modern wind energy generation facility (Arnett et al. 2008; Loss et al. 2013), and residual fatality events do not necessarily equate to significant adverse impacts, as described by USFWS (2012). This BBCS has laid out a comprehensive pathway by which Badger Wind has taken a multi-tiered approach toward reducing potential direct and indirect impacts to both birds and bats.

Relatively speaking “mass mortality events” at operational wind energy facilities remain rare events (e.g., Loss et al. 2013). The occurrence of abnormally large mortality events often have been associated with inclement weather conditions and deviations from facility lighting best management practices (Johnson et al. 2000; Kerns and Kerlinger 2004; American Bird Conservancy 2011). In the unlikely event of a mass fatality, the wind site manager will determine a best course of action regarding communication to appropriate agency personnel. Recurring mortality of species of concern or species susceptible to population-level impacts (see Beston et al. 2016) will also be considered when coordinating with appropriate agency personnel.

8. IMPLEMENTAION OF THE BADGER WIND PROJECT BBCS

8.1. Document Availability

This BBCS is subject to future revisions, as needed, and will be maintained by Badger Wind environmental staff. This BBCS will be kept on site throughout the operation of the Project.

8.1. Reporting

Any documented mortality of ESA-listed species or of either eagle species will be reported to the USFWS within 24 hours of discovery for the life of the Project. Badger Wind will communicate and coordinate with the USFWS and/or NDGF, as appropriate.

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FIGURES

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APPENDICES

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APPENDIX A

2019 AND 2022 IPAC ANALYSES

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APPENDIX B

SELECTED TIER 2 AND 3 BIRD AND BAT STUDY REPORTS FOR THE BADGER WIND PROJECT

**YEAR 1 ACOUSTIC BAT MONITORING
YEAR 1 PRE-CONSTRUCTION AVIAN STUDIES
WHOOPING CRANE STOPOVER HABITAT ASSESSMENT
YEAR 2 ACOUSTIC BAT MONITORING
YEAR 2 PRE-CONSTRUCTION AVIAN STUDIES**

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APPENDIX C

KEY CONTACTS

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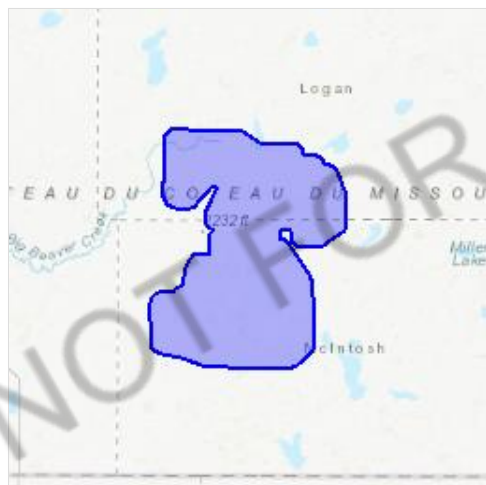
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Logan and McIntosh counties, North Dakota



Local office

North Dakota Ecological Services Field Office

☎ (701) 250-4481

📠 (701) 355-8513

3425 Miriam Avenue

Bismarck, ND 58501-7926

http://www.fws.gov/northdakotafieldoffice/endspecies/endangered_species.htm

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME

STATUS

Northern Long-eared Bat *Myotis septentrionalis* Threatened
 No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/9045>

Birds

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot <i>Calidris canutus rufa</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane <i>Grus americana</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/758	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>

- Measures for avoiding and minimizing impacts to birds
<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds
<http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

American Bittern *Botaurus lentiginosus*

Breeds Apr 1 to Aug 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

<https://ecos.fws.gov/ecp/species/6582>

American Golden-plover *Pluvialis dominica*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Black Tern <i>Chlidonias niger</i>	Breeds May 15 to Aug 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/3093	
Bobolink <i>Dolichonyx oryzivorus</i>	Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	
Chestnut-collared Longspur <i>Calcarius ornatus</i>	Breeds May 1 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	
Franklin's Gull <i>Leucophaeus pipixcan</i>	Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	
Lesser Yellowlegs <i>Tringa flavipes</i>	Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	
Marbled Godwit <i>Limosa fedoa</i>	Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	
Nelson's Sparrow <i>Ammodramus nelsoni</i>	Breeds May 15 to Sep 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	
Willet <i>Tringa semipalmata</i>	Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be

used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

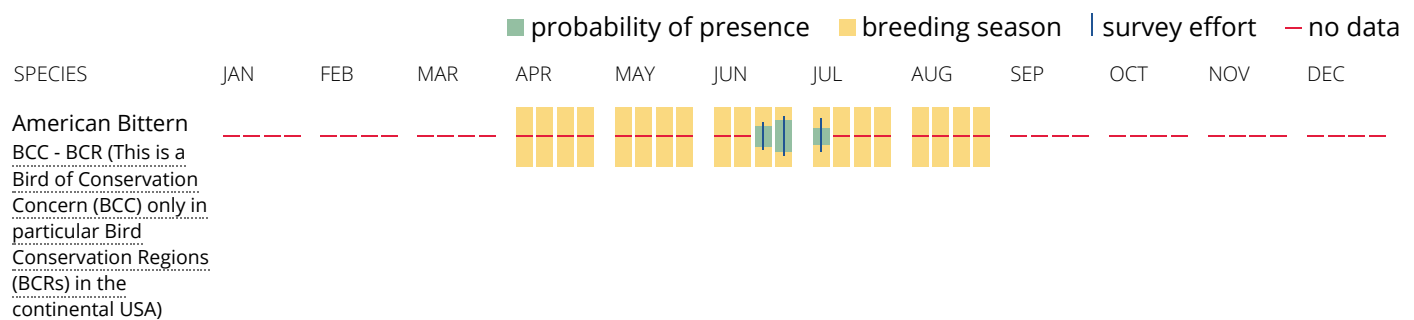
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



American Golden-plover
 BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Black Tern
 BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



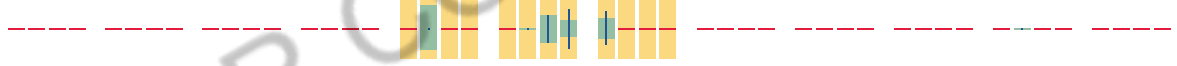
Bobolink
 BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Chestnut-collared Longspur
 BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



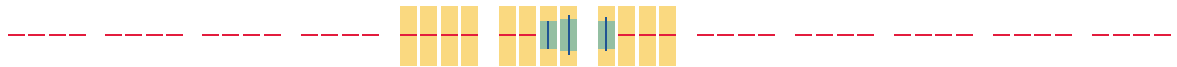
Franklin's Gull
 BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



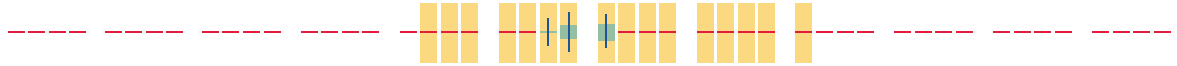
Lesser Yellowlegs
 BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Marbled Godwit
 BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Nelson's Sparrow
 BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



NOT FOR CONSULTATION

Willet

BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.


Facilities


National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

This location overlaps the following National Wildlife Refuge lands:

LAND	ACRES
Kulm Wetland Management District	1,358.57 acres

 (701) 647-2866

 (701) 647-2221

MAILING ADDRESS

P.O. Box E

Kulm, ND 58456-0170

PHYSICAL ADDRESS

1 First Street Sw

Kulm, ND 58456-7112

<https://www.fws.gov/refuges/profiles/index.cfm?id=62630>

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

The area of this project is too large for IPaC to load all NWI wetlands in the area. The list below may be incomplete. Please contact the local U.S. Fish and Wildlife Service office or visit the [NWI map](#) for a full list.

FRESHWATER EMERGENT WETLAND

[PEM1A](#)[PEM1C](#)[PEM1Ax](#)[PEM1F](#)[PEM1Cx](#)

FRESHWATER FORESTED/SHRUB WETLAND

[PFOA](#)

FRESHWATER POND

[PABFh](#)[PABFx](#)

RIVERINE

[R4SBC](#)[R5UBH](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Logan and McIntosh counties, North Dakota



Local office

North Dakota Ecological Services Field Office

☎ (701) 250-4481

📅 (701) 355-8513

3425 Miriam Avenue

Bismarck, ND 58501-7926

http://www.fws.gov/northdakotafieldoffice/endspecies/endangered_species.htm

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> There is final critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot <i>Calidris canutus rufa</i> Wherever found There is proposed critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane <i>Grus americana</i> There is final critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/758	Endangered

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES

THAT THE BIRD DOES NOT LIKELY
BREED IN YOUR PROJECT AREA.)

American Golden-plover *Pluvialis dominica*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds elsewhere

Black Tern *Chlidonias niger*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3093>

Breeds May 15 to Aug 20

Bobolink *Dolichonyx oryzivorus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 20 to Jul 31

Chestnut-collared Longspur *Calcarius ornatus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 1 to Aug 10

Franklin's Gull *Leucophaeus pipixcan*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 1 to Jul 31

Golden-winged Warbler *Vermivora chrysoptera*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/8745>

Breeds May 1 to Jul 20

Lesser Yellowlegs *Tringa flavipes*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9679>

Breeds elsewhere

Marbled Godwit *Limosa fedoa*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9481>

Breeds May 1 to Jul 31

Willet *Tringa semipalmata*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds Apr 20 to Aug 5

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review.

Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

This location overlaps the following National Wildlife Refuge lands:

LAND	ACRES
LOGAN COUNTY WATERFOWL PRODUCTION AREA	1,358.57 acres

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

The area of this project is too large for IPaC to load all NWI wetlands in the area. The list below may be incomplete. Please contact the local U.S. Fish and Wildlife Service office or visit the [NWI map](#) for a full list.

FRESHWATER EMERGENT WETLAND

[PEM1A](#)

[PEM1/ABF](#)

FRESHWATER POND

[PAB/EM1F](#)

[PABFh](#)

[PABFx](#)

[PABF](#)

LAKE

[L1UBG](#)

[L2ABG](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

Data limitations

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The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted.

Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTEATION

Key Contacts

Company	Name	Title	Email	Phone
Badger Wind Environmental Operations Support	Sarah Aftergood	Director of Environmental Permitting	SARAF@orsted.com	(512) 230-2148
	Charles Smith	Senior Director, Development	CHASM@orsted.com	(402) 290-6500
	Francesca Martella	Project Developer	FRKEH@orsted.com	(347) 522-0931
Badger Wind Operations and Maintenance	To Be Determined	To Be Determined	To Be Determined	To Be Determined
U.S. Fish and Wildlife Service (USFWS)	Heidi Riddle	Fish and Wildlife Biologist	heidi_riddle@fws.gov	(701) 355-8545
North Dakota Department of Game and Fish (NDGFD)	Elisha Mueller	Conservation Biologist	ekmueller@nd.gov	(701) 328-6348
	Sandra Johnson	Conservation Biologist	sajohnson@nd.gov	(701) 328-6382
Environmental Incident Reporting	North Dakota Department of Environmental Quality (DEQ)	N/A	N/A	(701) 328-5210
	Federal National Response Center (NRC) for the U.S. Environmental Protection Agency (USEPA) and the United States Coast Guard (USCG)	N/A	N/A	(800) 424-8802

FIGURES

CONFIDENTIAL: DO NOT DISTRIBUTE

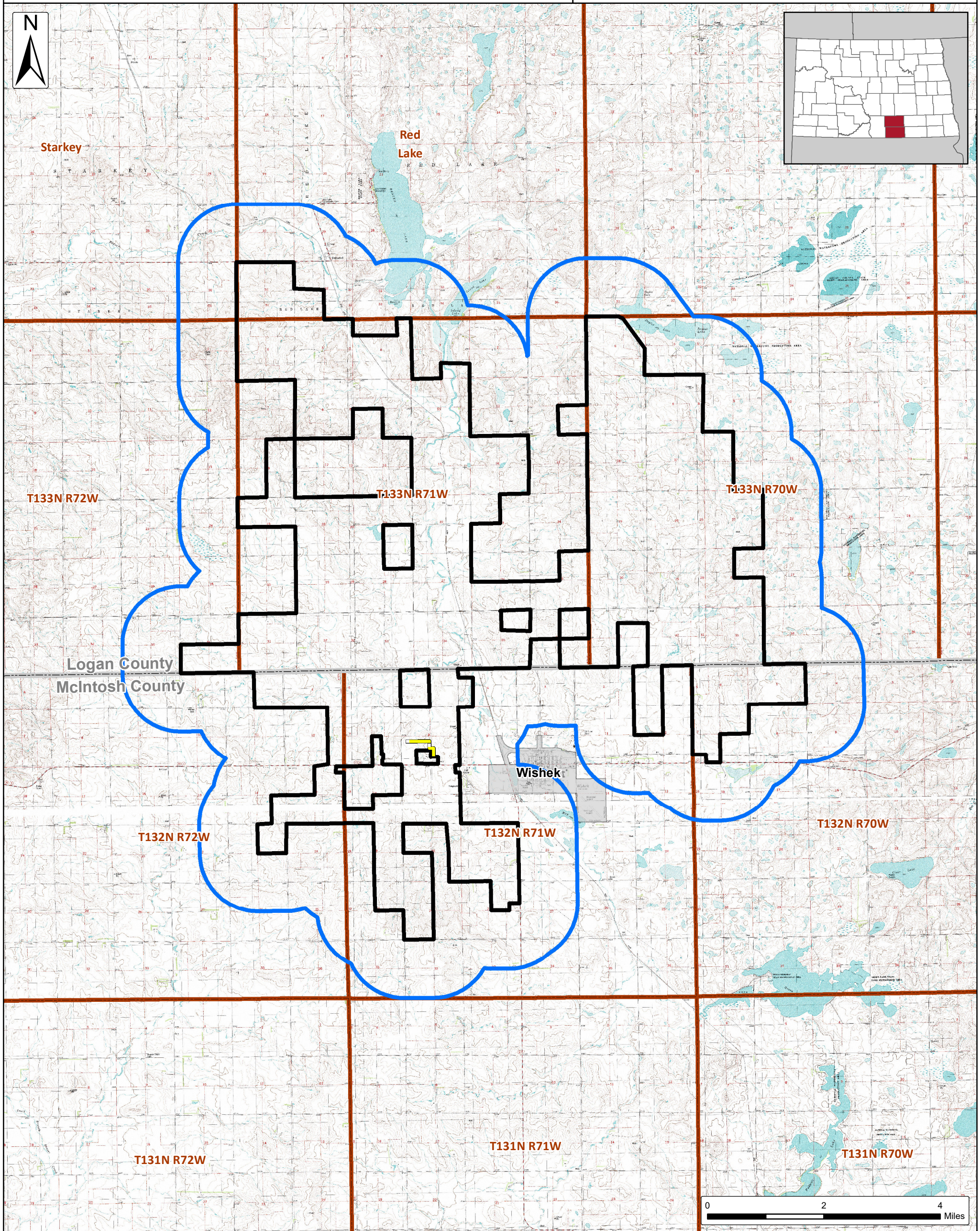
Badger Wind

Figure 1. Site Location

Logan and McIntosh Counties, North Dakota

Client:
**Badger Wind,
LLC**

Issue Date:
2/11/2022
Atwell, LLC Project:
19000785



- Project Area
02/10/2022 (~31,514 acres)
- 1-mile Buffer
- Proposed Transmission Line

- Township
- City/Village
- 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: USGS Topographic Quadrangle

Badger Wind

Figure 2. Land Cover Types within the Project Area

Logan and McIntosh Counties, North Dakota

Client:

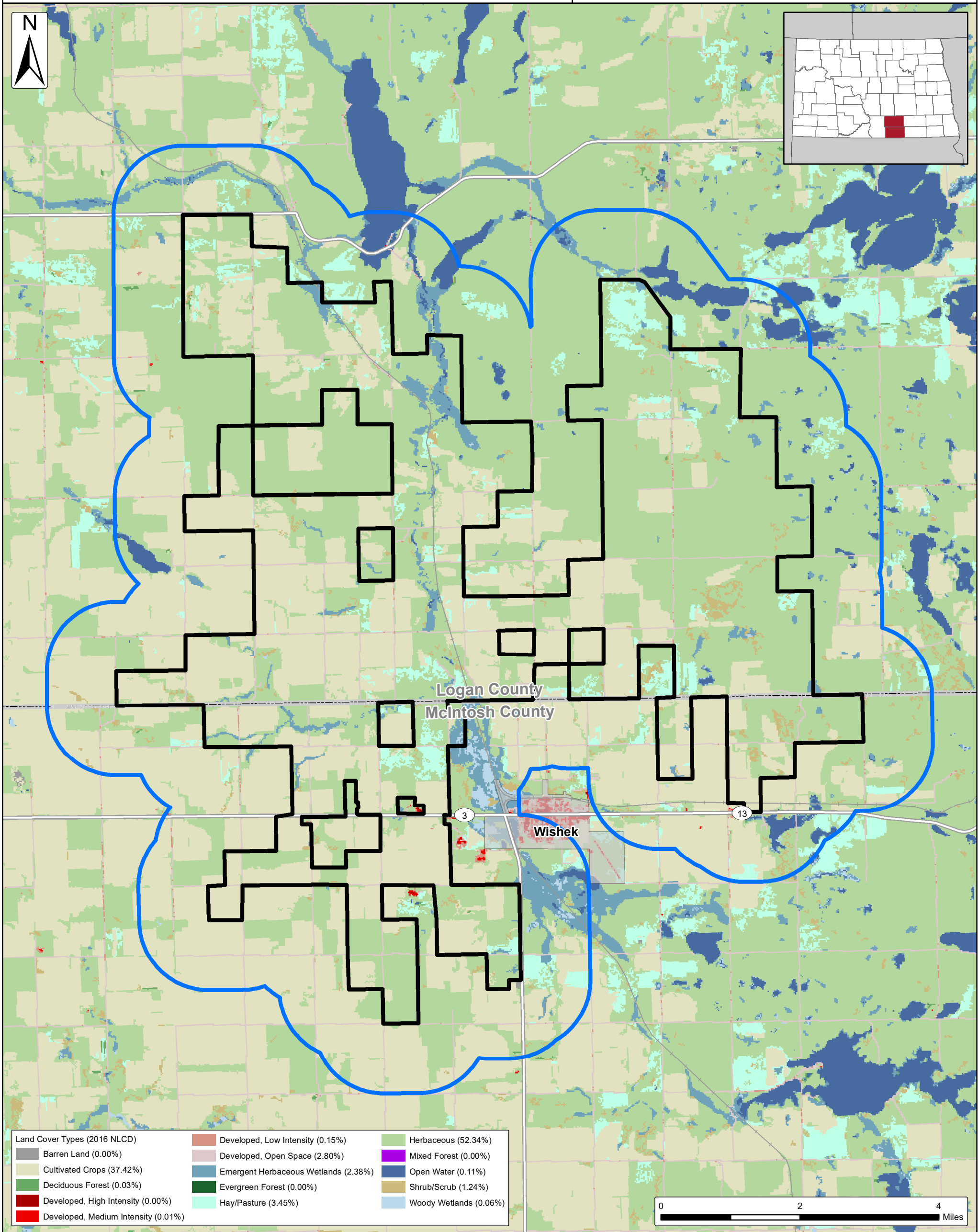
**Badger Wind,
LLC**

Issue Date:

2/11/2022

Atwell, LLC Project:

19000785



- Project Area
02/10/2022 (~31,514 acres)
- 1-mile Buffer
- City/Village
- Counties



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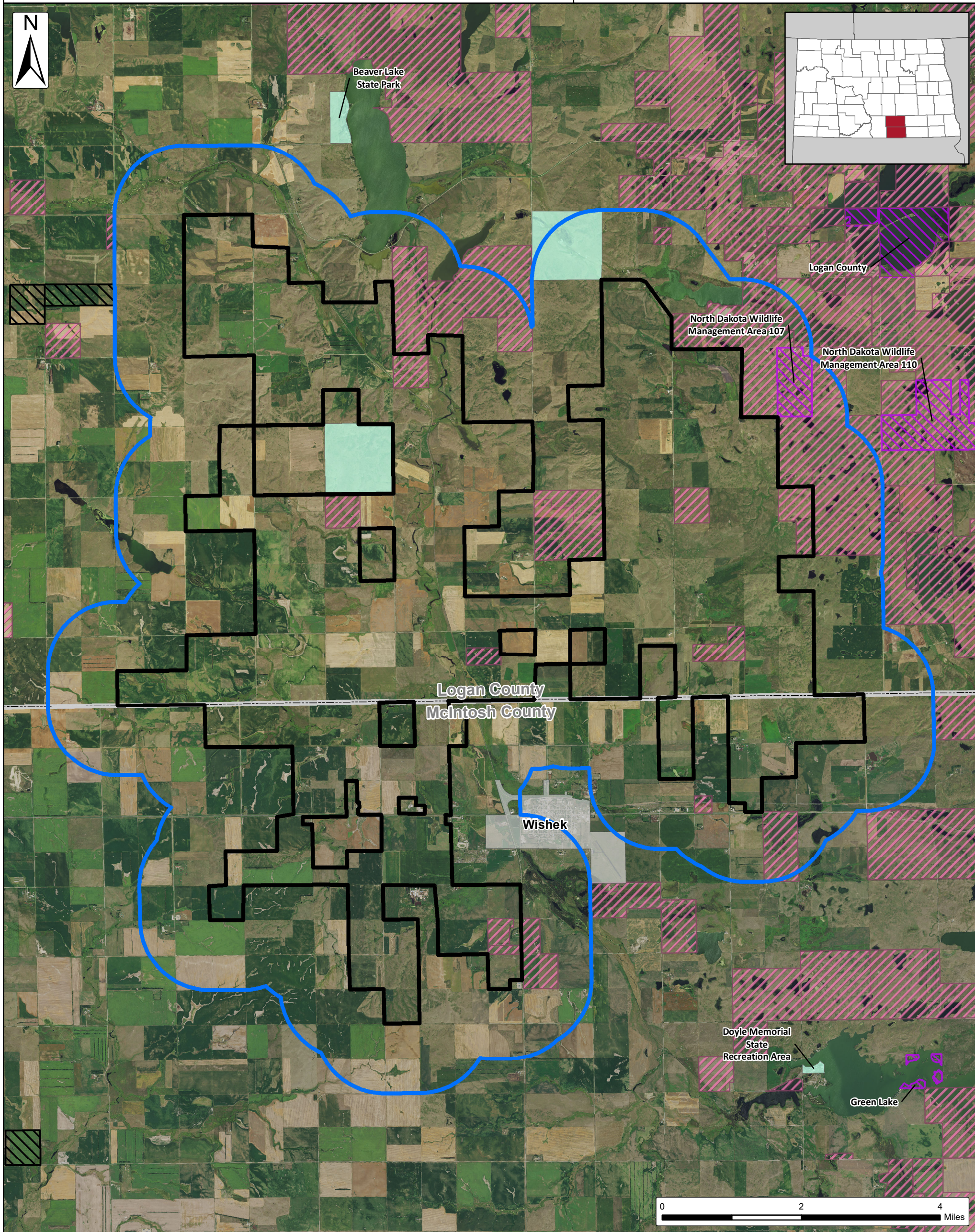
Badger Wind

Figure 3. Public Lands

Logan and McIntosh Counties, North Dakota

Client:
**Badger Wind,
LLC**

Issue Date:
2/11/2022
Atwell, LLC Project:
19000785



- Project Area
02/10/2022 (~31,514 acres)
- 1-mile Buffer
- PLOTS (NDGF)
- North Dakota Wildlife Management Area
- Waterfowl Production Area
- State Lands
- City/Village
- 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: National Agriculture Imagery Program (2020)

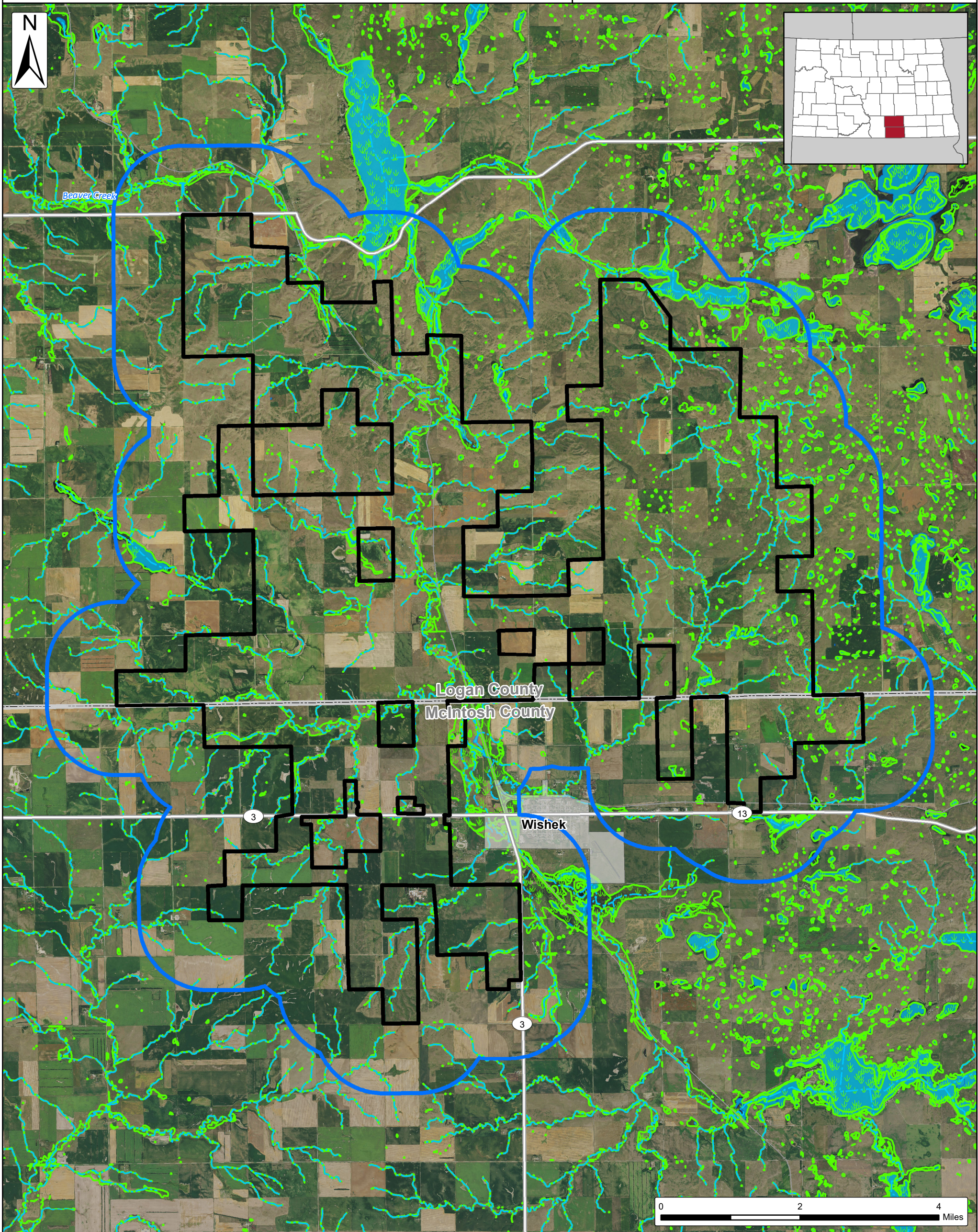
Badger Wind

Figure 4. Water Resources

Logan and McIntosh Counties, North Dakota

Client:
**Badger Wind,
LLC**

Issue Date:
2/11/2022
Atwell, LLC Project:
19000785



Project Area
02/10/2022 (~31,514 acres)

1-mile Buffer

Watercourse (NHD)

Waterbody (NHD)

Wetland (NWI)

City/Village

Counties



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Source: National Agriculture Imagery Program (2020)

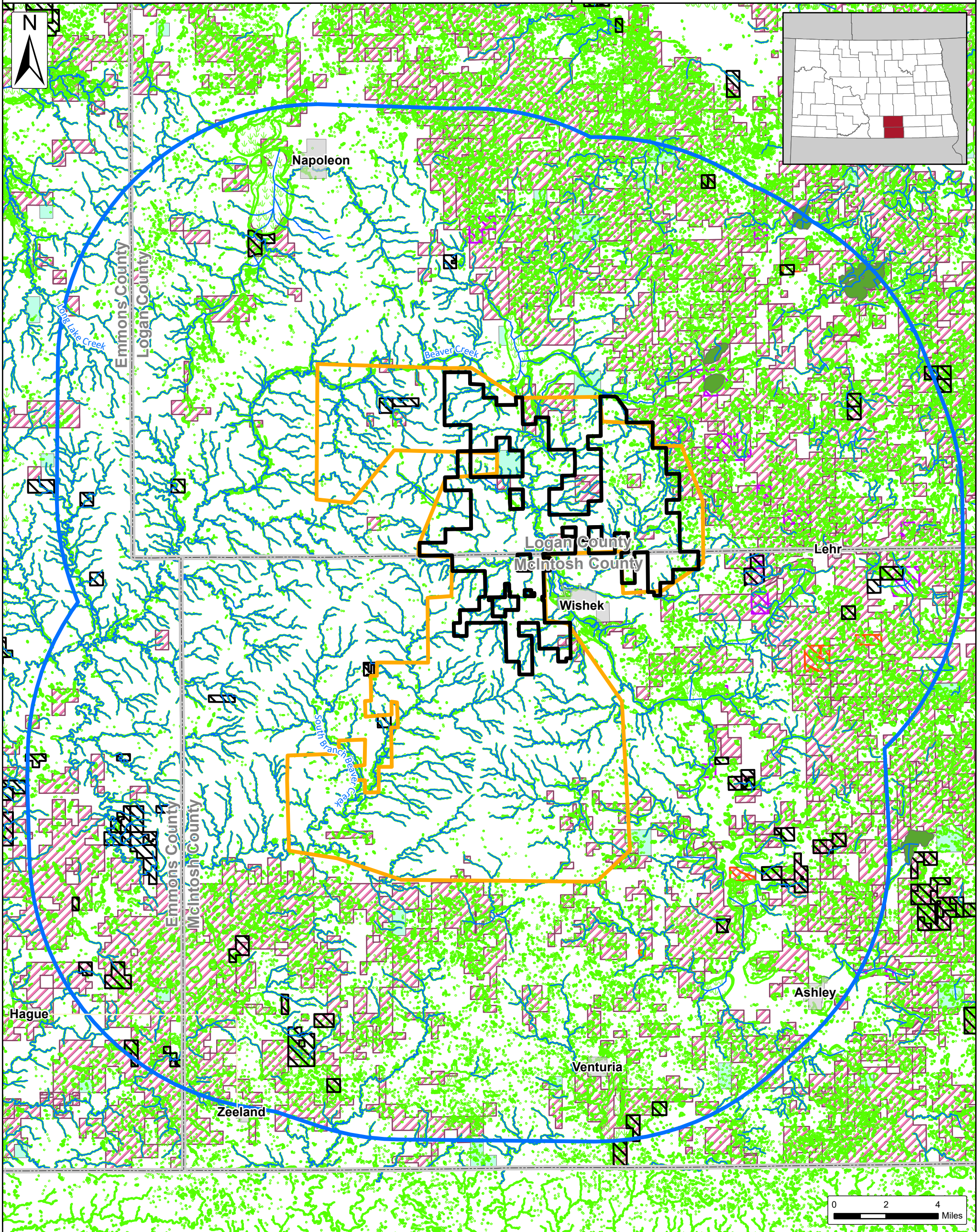
Badger Wind

Figure 5. Site Evaluation

Logan and McIntosh Counties, North Dakota

Client:
**Badger Wind,
LLC**

Issue Date:
2/11/2022
Atwell, LLC Project:
19000785



- | | |
|--|---------------------------------------|
| Project Area
01/28/2022 (~31,590 acres) | PLOTS (NDGF) |
| Study Area (2019) | North Dakota Wildlife Management Area |
| 10-mile Buffer | Waterfowl Production Area |
| Watercourse (NHD) | State Lands |
| Wetland (NWI) | Wetland Reserve Program |
| Critical Habitat | City/Village |
| | Counties |



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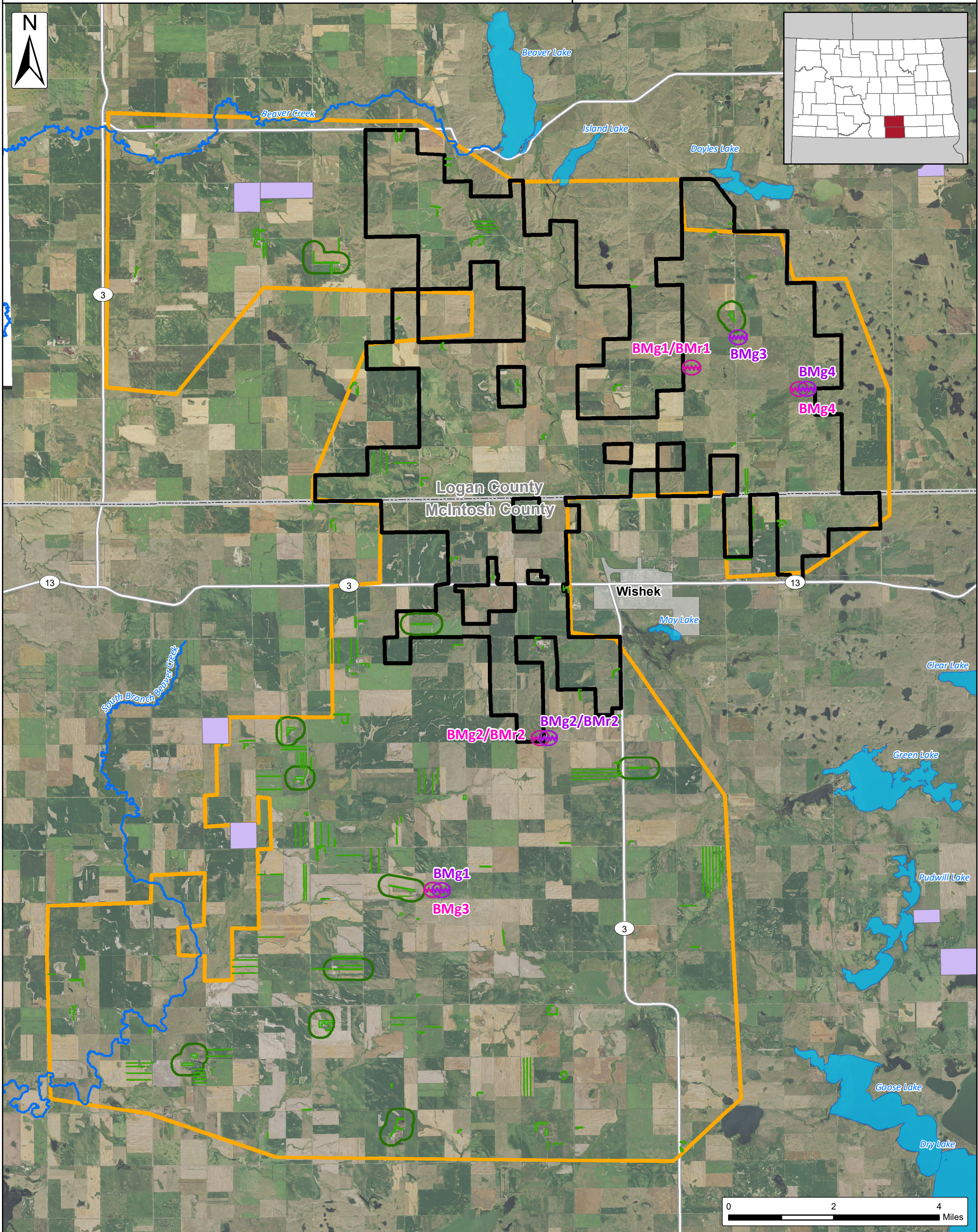
Badger Wind

Figure 6. Bat Resources

Logan and McIntosh Counties, North Dakota

Client:
**Badger Wind,
LLC**

Issue Date:
2/11/2022
Atwell, LLC Project:
19000785



- | | | |
|--|---|-------------------------|
| Project Area
02/10/2022 (~31,514 acres) | Bat Habitat | Acoustic Monitor (2019) |
| Study Area (2019) | Forested Areas Greater than
5 Acres and Connective
Woodlots 1,000-foot Buffer | Acoustic Monitor (2020) |
| City/Village | Major Watercourse (NHD) | |
| Counties | Waterbody (NHD) | |



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Source: National Agriculture
Imagery Program (2020)

Badger Wind

Figure 7. Avian Resources

Logan and McIntosh Counties, North Dakota

Client:

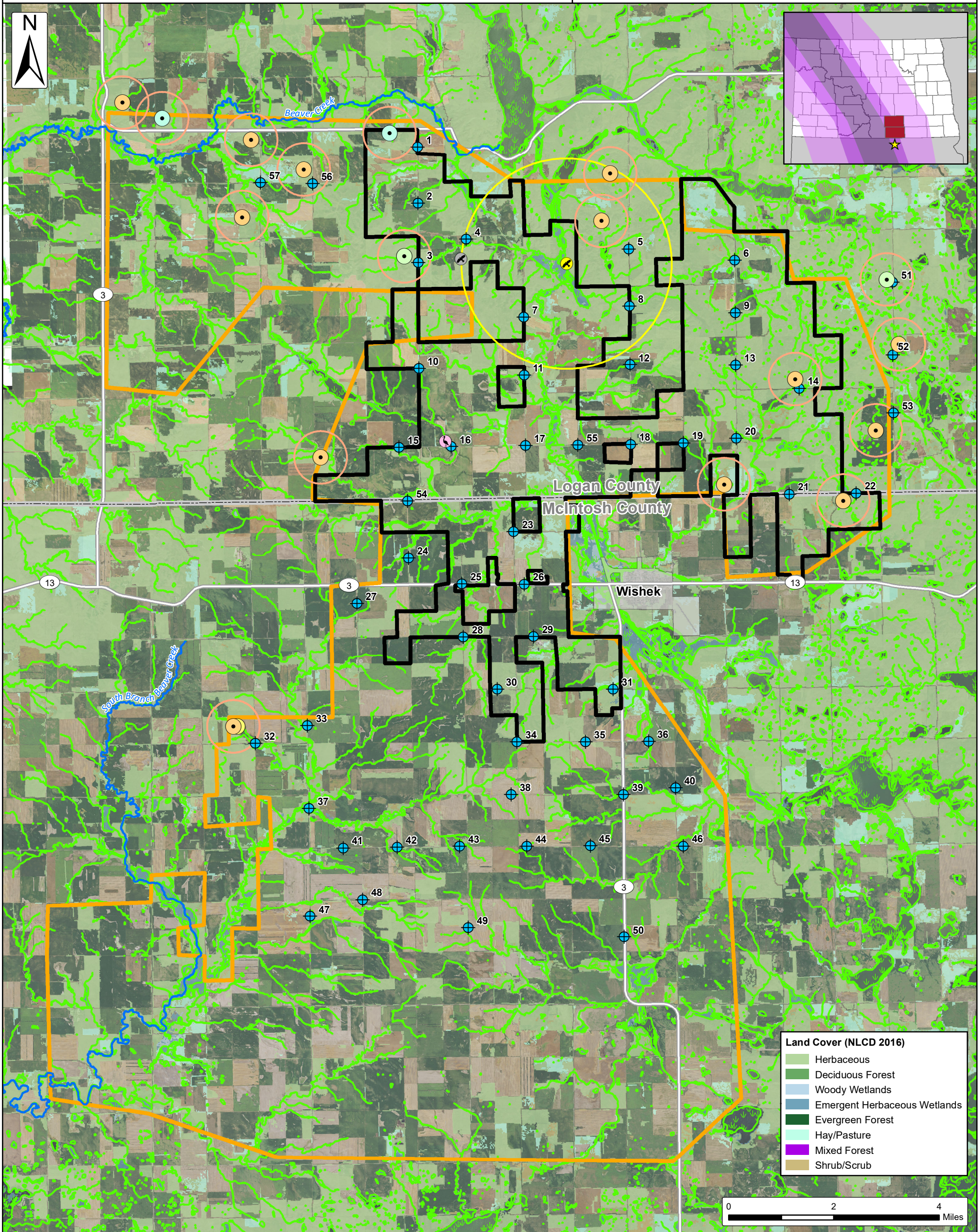
**Badger Wind,
LLC**

Issue Date:

2/11/2022

Atwell, LLC Project:

19000785

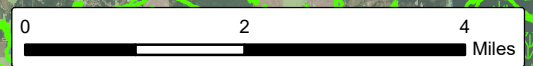


- Confirmed Lek (2019)
- Possible Lek (2019)
- Confirmed Lek (2020)
- Possible Lek (2020)
- Lek 0.5-mile Buffer
- Whooping Crane Sighting (2020)

- ✎ Bald Eagle Nest (In-Use)
 - ✎ Bald Eagle Nest (Alternate Site)
 - Bald Eagle Active Nest 2-mile Buffer
 - ~ Major Watercourse (NHD)
 - ~ Waterbody (NHD)
 - ~ Wetland (NWI)
 - + Avian Point Count Location
- Stations 27 and 28 replaced with 54 and 55 in August 2019.
Stations 35 and 36 replaced with 56 and 57 in May 2020.

- Project Area
02/10/2022 (~31,514 acres)
- Study Area (2019)
- City/Village
- Counties
- Whooping Crane Migration Corridor (USFWS)
- 50%
- 75%
- 95%

- Land Cover (NLCD 2016)**
- Herbaceous
 - Deciduous Forest
 - Woody Wetlands
 - Emergent Herbaceous Wetlands
 - Evergreen Forest
 - Hay/Pasture
 - Mixed Forest
 - Shrub/Scrub



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Source: National Agriculture Imagery Program (2020)

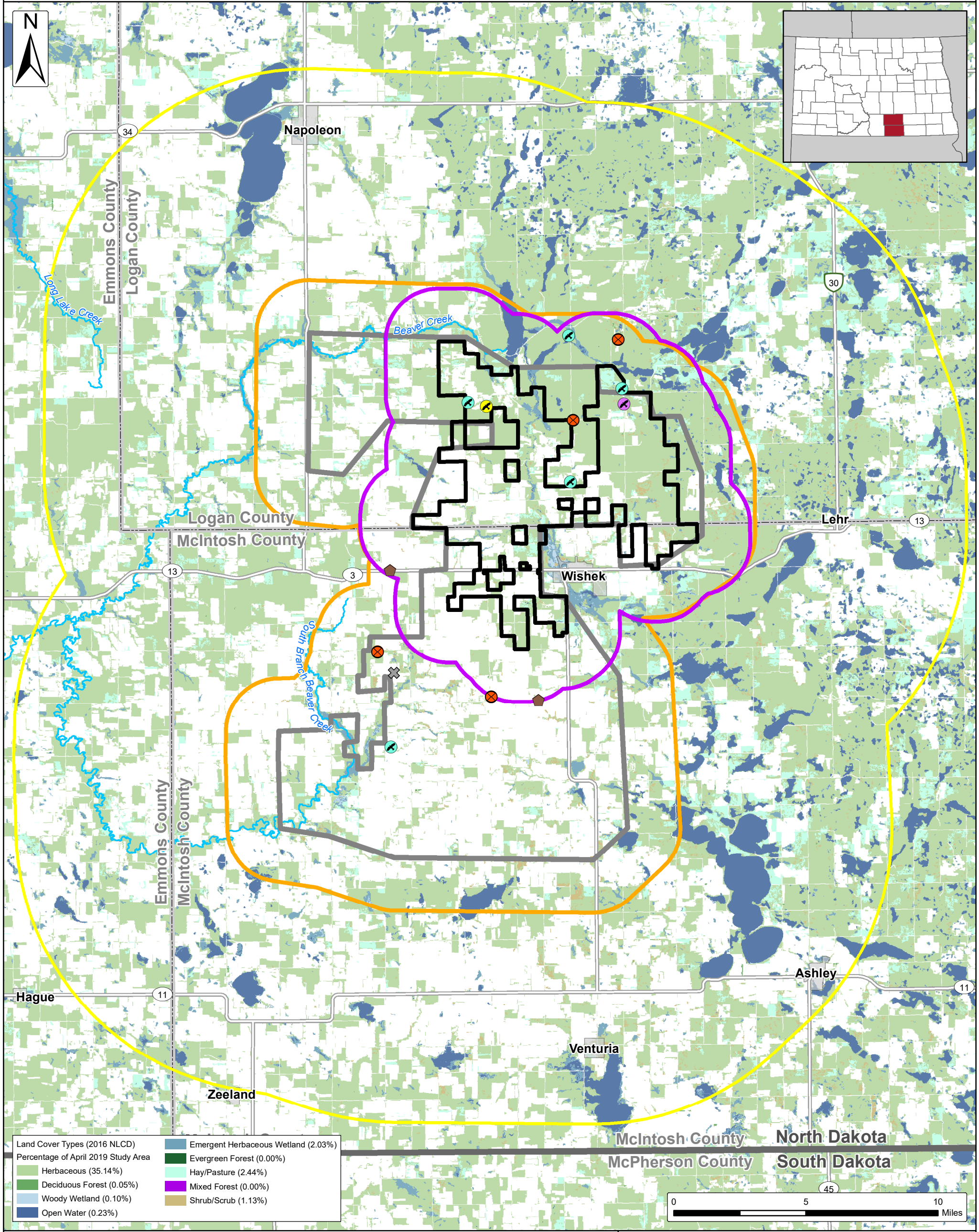
Badger Wind

Figure 8a. Year 1 Eagle and Raptor Nest Survey Results

Logan and McIntosh Counties, North Dakota

Client:
Badger Wind,
LLC

Issue Date:
2/11/2022
Atwell, LLC Project:
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SOURCE: USGS NATIONAL LAND COVER DATABASE (NLCD) 2016

Badger Wind

Figure 8b. Year 2 Eagle and Raptor Nest Survey Results

Logan and McIntosh Counties, North Dakota

Client:

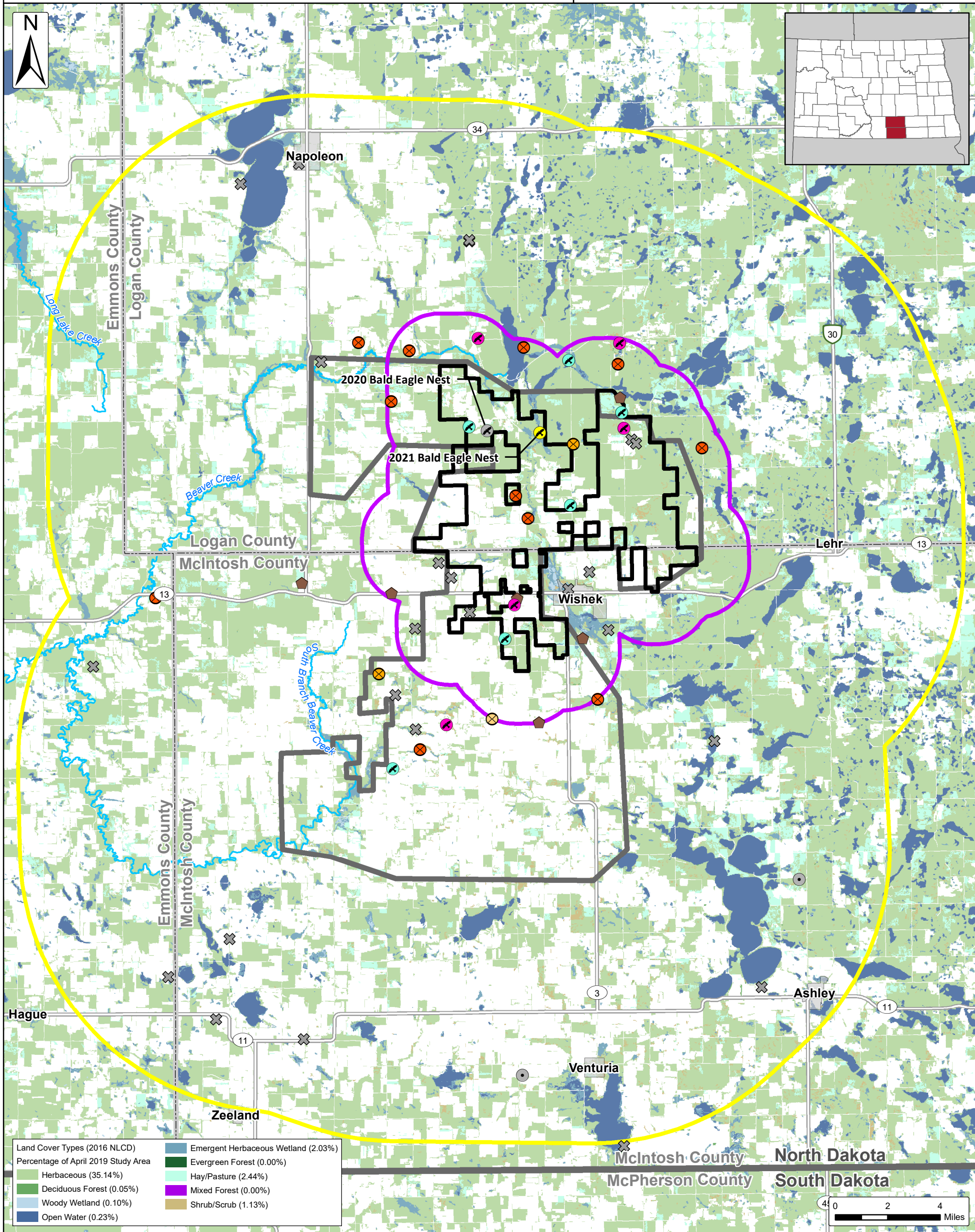
**Badger Wind,
LLC**

Issue Date:

2/11/2022

Atwell, LLC Project:

19000785



Land Cover Types (2016 NLCD)	
Herbaceous (35.14%)	Emergent Herbaceous Wetland (2.03%)
Deciduous Forest (0.05%)	Evergreen Forest (0.00%)
Woody Wetland (0.10%)	Hay/Pasture (2.44%)
Open Water (0.23%)	Mixed Forest (0.00%)
	Shrub/Scrub (1.13%)

Raptor Nests Identified during Year 2 Surveys

- Bald Eagle, In-Use
- Bald Eagle, Unoccupied*
- Ferruginous Hawk, In-Use
- Great Horned Owl, In-Use
- Red-tailed Hawk, Missing
- Red-tailed Hawk, In-Use
- Red-tailed Hawk, Status Unknown
- Swainson's Hawk, In-Use
- Unknown raptor, In-Use
- Unknown raptor, Status Unknown

- Major Watercourse (NHD)
- Project Area 02/10/2022 (~31,514 acres)
- Project Area 2-mile Buffer
- Study Area (2019)
- Eagle Nest Survey Area (4/15/2019 10-mile Buffer)

- City/Village
- County
- State Boundary

* This bald eagle nest was occupied during year 2 raptor nest surveys but went missing prior to spring 2021 point count surveys. The 2020 and 2021 bald eagle nests indicated on the map are believed to belong to the same nesting territory.

Source: National Land Cover Database (USGS, 2016)



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