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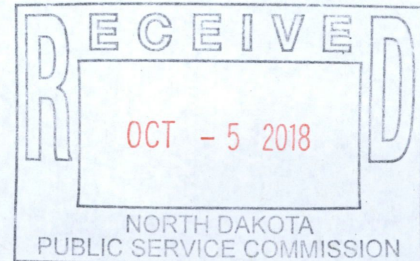
FISH AND WILDLIFE SERVICE North Dakota Ecological Services

3425 Miriam Avenue
Bismarck, North Dakota 58501-7926

October 5, 2018

IN REPLY REFER TO:
Emmons-Logan Wind
Energy Center

Ms. Lindsey (Meyers) Churchill
Environmental Project Manager
AECOM
1000 East Calgary Avenue, Suite 1
Bismarck, North Dakota 58503



Dear Ms. Churchill:

This letter is in response to your request dated May 8, 2018, for environmental comments regarding the Emmons-Logan Wind Energy Center and Transmission Line Project. The proposed 298.1 MW project is composed of 123 turbines and associated infrastructure including an approximately 7-mile long 230kV transmission line and another 14-mile long 115 kV transmission line. The project site is located approximately eight miles northeast of the town of Linton, occurring primarily in Emmons County, with the eastern portion of the project site extending into Logan County, North Dakota.

This letter provides information and recommendations regarding important wildlife habitats and U.S. Fish and Wildlife Service (Service) trust resources including federally listed species, eagles, birds of conservation concern, and other migratory birds that may occur in the project area and vicinity. We have included guidelines and methods to be applied to various components of a wind farm including turbines, meteorological towers, and power lines in order to avoid, minimize and/or compensate for impacts to trust resources and assist you in achieving compliance with Federal laws.

Grasslands

The North Dakota Game and Fish Department (NDGFD) indicated the importance of grasslands in their May 22, 2018, letter regarding this project. We also stress the value of these habitats. Native prairie, and prairie that may have been tilled briefly then left to return to grass ("go-back prairie"), are particularly important habitats. In addition to the intrinsic value of diverse native prairie plant communities, these areas represent a fraction of the prairie acres that once existed and harbored numerous native wildlife species, some of which cannot survive outside the native plant community. Note, that while native prairie is a conservation priority in the state, lesser-quality areas (e.g. grasslands with a high non-native plant component, overgrazed grasslands) are also valuable habitat for wildlife. Per the January 29, 2018, informational meeting on this project, efforts were made to avoid direct impacts to native grasslands. Per our September 19,

2018, meeting, NextEra confirmed that all turbines originally planned for placement on native grasslands have been removed from those areas. We acknowledge and appreciate this effort, and recommend complete avoidance of all grassland types on the area that provide habitat for wildlife (i.e. place turbines on cropland as much as possible) to further reduce direct and indirect impacts.

Wind Energy Guidelines

Per ongoing coordination regarding this project, NextEra is aware of our voluntary 2012 *U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines* (WEG) (available online at: <http://www.fws.gov/windenergy/>) which were developed in consultation with wind industry companies. We recommend close adherence to these guidelines, using the information gathered to first determine whether the project should be placed in the area of interest at all. The WEG invokes a tiered approach in which information is collected with increasing levels of detail in order to evaluate risk posed to habitats and wildlife at potential wind energy sites. Tiers 1-3 each represent a preconstruction decision point to either move forward to development, gather more information (i.e. move to the next tier), or to abandon project plans at a given site, thereby avoiding areas where development is precluded or where wildlife impacts are likely to be high and difficult or costly to remedy or mitigate at a later stage. If a project is to proceed at the chosen location, then the information gathered per the WEG is to be used to guide project specifics, such as turbine locations, and any needed mitigation measures. Wind energy facility effects to wildlife may be direct and indirect, including collision mortality, loss of habitat due to the footprint of the turbines/roads/other facilities, habitat fragmentation impacts, wildlife avoidance of turbines on the landscape, encroachment of invasive weeds, and more. Currently, the best strategy to avoid impacts to wildlife is to place wind energy facilities within existing cropland wherever possible, precluding impacts to valuable wildlife habitats. We request the results of any pre-/post-construction wildlife monitoring for this project.

WEG Survey Reports

Several reports of wildlife and habitat surveys conducted at the site by Western EcoSystems Technology, Inc., per the WEG have been completed. These cover the topics of grasslands, grassland breeding birds, large birds, raptor nests, whooping crane habitat, northern long-eared bat habitat, and sharp-tailed grouse leks. We note the following:

- **2017 Grassland Assessment**: this report indicates 40.4% of the project is composed of grasslands and 29.6% is unbroken prairie. We recommend, as indicated above, to continue efforts to avoid all grassland impacts.
- **2017 Grassland Breeding Bird Surveys**: this report shows the project site harbors eleven North Dakota Species of Conservation Priority (identified by North Dakota Game and Fish), and per our agency lists there are five species (plus an additional species in the large birds report) identified as North Dakota Species of Habitat Fragmentation Concern and five Birds of Conservation Concern (with some overlap among these lists). Declines in these grassland bird populations are the reason for our first and foremost recommendation to avoid grassland impacts. Proactive measures and preservation and management of the prairie are critical for these sensitive species' conservation. In this report, a few survey locations (sites 3A, 10A, and 10B) were noted to have relatively high

numbers of birds. If the project progresses, we recommend high-use sites and areas with similar habitat be avoided.

- **Large Bird Use Survey Report and 2017 Raptor Nest Surveys:** During point counts 14 North Dakota Species of Conservation Priority were observed, and as with breeding grassland birds, overlap occurs with some of these species also occurring on the Service's Birds of Conservation Concern and North Dakota's Species of Habitat Fragmentation Concern lists. Point counts and an aerial stick nest survey did not reveal high numbers of eagles in the project; one bald eagle and one golden eagle were observed during point counts within the project boundary and no eagle nests were discovered within the boundary; however, 2 active (bald eagle) and 3 inactive eagle nests were found within the 10 mile buffer. As noted in the NDGFD May 22, 2018, letter, the bald eagle population in North Dakota is rising and risks to this species could increase in the future. More information on eagles is provided below. Ferruginous hawk nests were observed at the site; this is another species occurring on sensitive species lists and nests/habitats should be avoided. Snow geese and sandhill cranes were observed in large flocks in the project area per this report, particularly at survey site #5. Impacts to such concentrated use areas should also be avoided. The presence of sandhill cranes is of particular concern due to the fact that whooping cranes often migrate with sandhill cranes and use the same habitats. The project falls within the 75% band of the whooping crane migration corridor.
- **Whooping Crane Habitat Review:** As above, with the project location within the 75% band of the whooping crane corridor, suitable stopover habitat at the site, and sandhill crane flock observations, whooping crane occurrence at the project area is possible. If the project proceeds at this location, measures to detect whooping cranes and reduce risk via turbine shutdowns are recommended, as is marking of overhead lines to reduce the risk of collision mortality. More on whooping cranes and line marking is provided herein.
- **2017 Sharp-tailed Grouse Lek Report:** two grouse leks inside the project area and one outside the boundary were detected via aerial surveys. Grouse are sensitive to fragmentation; turbines and other infrastructure should be placed to avoid leks. We recommend coordination with the NDGFD regarding appropriate buffers to minimize impacts to grouse.
- **Northern Long-Eared Bat Desktop Habitat Assessment:** much information about the northern long-eared bat has been obtained from the eastern portion of their range and much less is known about this species occurrence, habitat use, and behavior in this western portion of its range. The desktop assessment did not identify significant northern long-eared bat habitat in the project area, but actual surveys that attempt to identify species of bats that occur at the site are more useful. If not the northern long-eared bat, other species are likely to occur in the project area. Increasing turbine cut-in speeds above those recommended by turbine manufacturers (at least 5 meters/second), particularly during migratory timeframes for bats, is currently one of the most helpful mitigation tools we recommend to reduce bat mortality.

U.S. Fish and Wildlife Service Land Interests

The location of the proposed wind facility is within the jurisdictional area of two of the Service's Wetland Management Districts (WMD): Long Lake WMD and Kulm WMD. If project facilities are proposed on or near private lands with Service grassland and/or wetland easements, or if our agency owns land in/near the site, direct impacts (via associated infrastructure placement on easements) or indirect impacts (via avian avoidance of turbines near easements, described in more detail below) to these properties may occur. WMDs are administered and managed by our Refuges Division. If you have not already done so, please coordinate with each of the aforementioned WMDs regarding the location of Service land interests in/near your project area. North Dakota WMD contact information may be found here: <https://www.fws.gov/offices/Directory/ListOffices.cfm?statecode=38>.

Eagle Guidance

Bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) occur in North Dakota. They are protected from a variety of harmful actions via take prohibitions in both the Migratory Bird Treaty Act¹ (MBTA; 16 U.S.C. 703-712) and the Bald and Golden Eagle Protection Act (BGEPA; 16 U.S.C. 668-668d). The BGEPA, enacted in 1940 and amended several times, prohibits take of bald eagles and golden eagles, including their parts, nests, young or eggs, except where otherwise permitted pursuant to federal regulations. Incidental take of eagles from actions such as electrocutions from power lines or wind turbine strikes are prohibited unless specifically authorized via an eagle incidental take permit from US Fish and Wildlife Service (Service). BGEPA provides penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." BGEPA defines take to include the following actions: "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." The Service expanded this definition by regulation to include the term "destroy" to ensure that "take" also encompasses destruction of eagle nests. Also the Service defined the term disturb which means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

The Service has developed guidance for the public regarding means to avoid take of bald and golden eagles:

¹ On December 22, 2017, the Department of the Interior's (DOI) Office of the Solicitor Memorandum M-37050 titled The Migratory Bird Treaty Act Does Not Prohibit Incidental Take (<https://www.doi.gov/sites/doi.gov/files/uploads/m-37050.pdf>) concludes that the MBTA's prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same apply only to affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs. The MBTA list of protected species includes bald and golden eagles and the law has been an effective tool to pursue incidental take cases involving eagles. However, the primary law protecting eagles is the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S. Code § 668), since the bald eagle was delisted under the Endangered Species Act in 2007. Memorandum-37050 does not affect the ability of the Service to refer entities for prosecution that have violated the take prohibitions for eagles established by the BGEPA.

- The 2007 *National Bald Eagle Management Guidelines* serve to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of BGEPA may apply. They provide conservation recommendations to help people avoid and/or minimize such impacts to bald eagles, particularly where they may constitute “disturbance,” which is prohibited by the BGEPA.
<https://www.fws.gov/northeast/ecologicalservices/pdf/NationalBaldEagleManagementGuidelines.pdf>
- The 2013 *Eagle Conservation Plan Guidance, Module 1- Land-based Wind Energy, Version 2* is specific to wind energy development and provides in-depth guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities. Development of an Eagle Conservation Plan per these guidelines may serve as the basis for applying for an eagle incidental take permit for wind energy facilities. Applications for such eagle incidental take permits must include an Eagle Conservation Plan.
<https://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance.pdf>

Finally, the Service has promulgated new permit regulations under BGEPA:

- New eagle permit regulations, as allowed under BGEPA, were promulgated by the Service in 2009 (74 FR 46836; Sept. 11, 2009) and revised in 2016 (81 FR 91494; Dec. 16, 2016). The regulations authorize the limited take of bald and golden eagles where the take to be authorized is associated with otherwise lawful activities. These regulations also establish permit provisions for intentional take of eagle nests where necessary to ensure public health and safety, in addition to other limited circumstances. The revisions in 2016 included changes to permit issuance criteria and duration, definitions, compensatory mitigation standards, criteria for eagle nest removal permits, permit application requirements, and fees in order to clarify, improve implementation and increase compliance while still protecting eagles.
<https://www.gpo.gov/fdsys/pkg/FR-2016-12-16/pdf/2016-29908.pdf>

The Service’s Office of Law Enforcement carries out its mission to protect eagles through investigations and enforcement, as well as by fostering relationships with individuals, companies, industries and agencies that have taken effective steps to avoid take, including incidental take of these species, and encouraging others to implement measures to avoid take. The Office of Law Enforcement focuses its resources on investigating individuals and entities that take eagles without identifying and implementing all reasonable, prudent and effective measures to avoid that take. Those individuals and entities are encouraged to work closely with Service biologists to identify available protective measures, and to implement those measures during all activities or situations where their action or inaction may result in the take of an eagle(s).

Note that the Service has also developed recommendations for wind developers specific to the Mountain-Prairie Region (Region 6):

- Region 6 Recommendations for Avoidance and Minimization of Impacts to Golden Eagles at Wind Energy Facilities –The goal of these recommendations is to contribute to maintaining stable or increasing breeding populations of eagles by recommending conservation measures that will maintain breeding territories and minimize impacts to other important eagle use areas (e.g., eagle nests, foraging areas, and communal roosts). https://www.fws.gov/coloradoes/documents/Final_GOEA_Buffer_Recommendations_AvoidanceMinimization_WindFacilities_April_10_2013.pdf.
- Final Outline and Components of an Eagle Conservation Plan (ECP) for Wind Development: Recommendations from USFWS Region 6 – In the event a project proponent intends to develop an ECP, this Region 6 document provides recommendations, in an outline format, for developing and organizing the content of an ECP, and includes additional details on topics that should be addressed in the plan. https://www.fws.gov/coloradoes/documents/Final_USFWS_R6_ECP_guidance.pdf.

It is our understanding that the developer, NextEra, is aware of at least some of the guidance above and the potential for an eagle take permit. We recommend close adherence to this guidance and request results of any additional eagle data collected project site.

Threatened/Endangered Species

In accordance with section 7(c) of the Endangered Species Act (ESA), as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed species may occur in the project area (this list is considered valid for 90 days):

<u>Species</u>	<u>Status</u>	<u>Expected Occurrence</u>
Least Tern (<i>Sterna antillarum</i>)	Endangered	Migration or nesting
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Threatened	Summer resident, seasonal migrant known winter resident in the Black Hills
Piping Plover (<i>Charadrius melodus</i>)	Threatened	Migration or nesting
Rufa Red Knot (<i>Calidris canutus rufa</i>)	Threatened	Rare seasonal migrant
Whooping Crane (<i>Grus Americana</i>)	Endangered	Spring and fall migration

Least Tern and Piping Plover

Least terns and piping plovers occur along the Missouri River in North Dakota, and the piping

plover also uses alkaline wetlands in the state. These species use sparsely vegetated interchannel sandbars, islands, and shorelines for nesting, foraging and brood-rearing. They are sensitive to human disturbances which can limit reproduction. No construction should take place within 1/4 mile of any known piping plover or least tern nest. The specific migration habits of the least tern and piping plover in North Dakota are not known, but since the project area is within the vicinity of the Missouri River, it may be possible for the birds to occur in the project area as they migrate to/from nesting areas or as they forage or disperse from natal areas. Both species typically occur in North Dakota May through August.

Northern Long-eared Bat:

The northern long-eared bat is a medium-sized brown bat listed as threatened under the Endangered Species Act. Northern long-eared bats are known to be present in North Dakota during the summer months, primarily roosting singly or in colonies underneath bark, in cavities or in crevices of both live and dead trees. The species has been documented in forested areas in the state during the summer months and along the Missouri River during migration. Summer survey guidelines for this species are identical for those established for the Indiana Bat (online at: <https://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html>). White nose syndrome - a fungus affecting hibernating bats - is considered a significant threat to this species, but individuals may be harmed by other activities such as modifications to hibernacula, timber harvest, human disturbance, and collisions with wind turbines. Currently, feathering turbine blades and increasing cut-in speeds are recommended measures to reduce the risk of bat mortality at wind generation facilities. A 4(d) rule has been published that exempts take of Northern long-eared bats in certain circumstances. For more information, see: <https://www.fws.gov/Midwest/Endangered/mammals/nleb/index.html>.

Rufa Red Knot:

The rufa red knot is a robin-sized shorebird listed as threatened under the Endangered Species Act. The red knot migrates annually between its breeding grounds in the Canadian Arctic and several wintering regions, including the Southeast United States, the Northeast Gulf of Mexico, northern Brazil, and Tierra del Fuego at the southern tip of South America. Although it is primarily a coastal species, small numbers of rufa red knots are reported annually across the interior United States (i.e., greater than 25 miles from the Gulf or Atlantic Coasts) during spring and fall migration. These reported sightings are concentrated along the Great Lakes, but multiple reports have been made from nearly every interior State, including North Dakota. The species does not breed in this state.

Whooping Crane:

The proposed wind farm is within the documented migration corridor of the Aransas/Wood Buffalo population of whooping cranes - the only self-sustaining migratory population of whooping cranes in existence. Whooping cranes migrate through North Dakota twice annually on their way to northern breeding grounds and southern wintering areas, occupying numerous habitats such as cropland and pastures; wet meadows; shallow marshes; shallow portions of rivers, lakes, reservoirs, and stock ponds; and both freshwater and alkaline basins for feeding and loafing. Overnight roosting sites frequently require shallow water in which to stand and rest. Whooping cranes are large birds with low maneuverability. Line strike mortality is the greatest known threat to fledged whooping cranes; more information on this topic is provided herein (see

enclosure: *Region 6 Guidance for Minimizing Effects from Power Line Projects within the Whooping Crane Migration Corridor*, and Power Lines section below). Mortality via turbine strikes may also pose a risk if the birds utilize habitat at/near wind farm sites. Loss of stopover habitat in the migration corridor is a concern that may be realized if whooping cranes tend to avoid wind farms. Additionally, should construction occur during spring or fall migration, the potential for disturbances to whooping cranes exists. Disturbance (flushing the birds) stresses them at critical times of the year and should be avoided. These issues should be addressed prior to wind farm development. Sightings of whooping cranes at any time should be reported to this office. As noted earlier, use of the proposed project area by sandhill cranes is indicative of the potential presence of whooping cranes since the two species are often observed utilizing the same habitats and migrating together.

Wetlands

According to National Wetlands Inventory maps, available online at: <https://www.fws.gov/wetlands/>, numerous wetlands exist within the proposed project area, including several relatively large water bodies nearby which may attract high numbers of migratory birds and perhaps whooping cranes as mentioned above. If a project may impact wetlands or other important fish and wildlife habitats, the Service, in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible; then minimization of any adverse impacts; and finally, replacement of any lost acres; in that order. Alternatives should be examined and the least damaging practical alternative selected. If wetland impacts are unavoidable, a mitigation plan addressing the number and types of wetland acres to be impacted and the methods of replacement should be prepared and submitted to the resource agencies for review.

Birds of Conservation Concern

Per survey reports from the Emmons-Logan Wind Energy Center site, you are aware of our Birds of Conservation Concern 2008 publication, which may be found online at: <https://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.pdf>. This document is intended to identify species in need of coordinated and proactive conservation efforts among State, Federal, and private entities, with the goals of precluding future evaluation of these species for ESA protections and promoting/conserving long-term avian diversity. Primary threats impacting grassland bird species that occur in North Dakota are habitat loss and fragmentation. In accordance with Executive Order 13186 regarding migratory bird protection, we recommend avoidance, minimization, and finally compensation to reduce the impacts to species protected by the MBTA, including BCC species. Compliance with this law may be partially addressed in a Bird and Bat Conservation Strategy (BBCS) (identified within the WEG and explained further below).

Avian Avoidance of Wind Turbines

As indicated in the WEG, wind turbines are known to impact migratory birds directly, with post-construction mortality surveys typically recommended for 1-2 years (or more) in order to

identify mortality levels. Importantly, the WEG also identifies the indirect effects of wind energy facilities such as fragmentation effects and avian avoidance of turbines resulting in displacement to other habitats. While direct impacts can readily be observed and quantified, these indirect impacts are more difficult to quantify and requires more time and effort. The Before-After-Control-Impact (BACI) method for avian studies is recommended in the WEG. This study design is particularly useful in determining indirect effects of wind projects on wildlife, but such studies are rarely conducted typically due to those time/effort constraints. In the absence of robust project-specific research at every wind farm, two relatively recent government studies are of particular importance to this issue of quantifying avoidance/displacement: Loesch et al. 2013 and Shaffer and Buhl 2016.

Loesch et al. 2013 evaluated breeding waterfowl pairs on wetlands at existing wind farms and reference sites in the Prairie Pothole Region. Displacement within 805 meters (0.5 mile) of wind turbines was detected at an average rate of 21% by five waterfowl species.

Similarly, Shaffer and Buhl 2016 evaluated wind farms and reference sites in the Prairie Pothole Region, but their research was on grassland nesting birds and also included pre-construction data thus this study applied the BACI method. Their results also detected avoidance of turbines by seven species. The average rate of displacement out to 300 meters (0.19 mile) from wind turbines was 55% by the 5th year post construction. This research also detected a trend: displacement rates of grassland nesting birds continued to increase over time (the study included 5 years of data).

Both of these peer reviewed, published were conducted over multiple years, on multiple wind farms, involved large sample sizes, used reference sites for comparison, and were conducted on wind farms in North and South Dakota where many of the same species likely to occur at the Emmons-Logan Wind Energy Center were observed to avoid wind turbines. If this project proceeds, we recommend quantification of wetlands within ½ mile of turbines, of grasslands within 300 m of turbines, and then application of the displacement rates from the Loesch et al. 2013 and Shaffer and Buhl 2016 studies to determine and disclose anticipated indirect impacts. This information is needed to adequately develop an appropriate mitigation plan to offset this form of habitat loss and we encourage project developers to provide that plan as part of the project.

Note that the authors (C. Loesch and J. Shaffer) are currently working together to publish a manuscript on methods to quantify these effects to waterfowl and grassland nesting birds using data from their peer-reviewed published studies; thus additional information will be available in the future.

Mitigation

The Service's mitigation policy, available online at: https://www.fws.gov/policy/a1npi89_02.pdf, was established to help assure consistent and effective mitigation recommendations that help Federal action agencies and developers plan for mitigation measures early, avoid delays, and assure equal consideration of fish and wildlife resources with other project features and purposes. Our policy adopts the definition of the term "mitigation" as stated in the NEPA regulations which

includes: “(a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments.” As noted above, direct and indirect effects to wildlife are known to occur at wind energy facilities. We encourage requires the analysis of both types of impact and quantification of those impacts whenever possible. The mitigation methods above can be applied to reduce direct and indirect effects at any point in the process of project development; however, we recommend early planning to help ensure full implementation of any necessary mitigation measures.

Bird and Bat Conservation Strategy

Bird and bat conservation strategies are recommended in the WEG. We have developed regional document to further assist companies in following our established national guidance on BBCSs, *U.S. Fish and Wildlife Service, Region 6, Mountain-Prairie Region Outline for a Bird and Bat Conservation Strategy: Wind Energy Projects* available online at: <https://www.fws.gov/coloradoes/documents/Final%20R6%20BBCS%20Outline%20with%20anotation.pdf>. As stated in the introduction of that document: a BBCS “...is a life-of-a-project framework for identifying and implementing actions to conserve birds and bats during wind energy project planning, construction, operation, maintenance, and decommissioning. It is the responsibility of wind energy project developers and operators to effectively assess project-related impacts to birds, bats and their habitats, and to work to avoid and minimize those impacts.” A BBCS explains the actions taken by developers as they progress through the tiers of the WEG, describing the analyses, studies, and reasoning implemented with the purpose of mitigating for potential avian and bat impacts. It also addresses post-construction monitoring and habitat impacts.

Meteorological Towers

Communication towers are a known mortality hazard to wildlife, particularly birds. To assist developers in establishing communications towers that are more compatible with wildlife, we have developed our 2018 *Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning*, available online at: <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds/collisions/communication-towers.php>. These recommendations incorporate the state of the science and the 2015 Federal Aviation Administration’s *Obstruction Marking and Lighting Advisory Circular AC 70/7460-1L*, online at: https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_70_7460-1L_with_chg_1.pdf. Among the primary concerns addressed within our guidelines are the establishment of new towers on the landscape, the heights of these towers, their lighting scheme, and means of structural support. Collocation of communications tower facilities on an existing structure is strongly recommended to avoid any additional impacts to migratory birds. If a new tower is necessary, placement of the new tower near other existing structures is recommended to concentrate the risk posed by the towers to relatively small areas. Minimization of tower height (below 200 feet to preclude the need for Federal Aviation Administration lighting requirements), use of only strobe or flashing lights (avoid steady-burning lights), and avoidance of guy wires (a

great deal of avian mortality is a result of collisions with supporting guy wires) are important components intended to minimize potential impacts to migratory birds. The habitat at a tower location and surrounding area can also affect its level of risk to wildlife. Tower placement should occur in degraded sites avoiding ridgelines, coastal areas, wetlands or other bird concentration areas such as staging areas, rookeries, leks, and state or federal refuges. Please see the website provided above for additional information.

Overhead Power Lines

The construction of additional overhead power lines associated with wind farms creates the threat of avian electrocution, particularly for raptors. Thousands of these birds, including endangered species, are killed annually as they attempt to utilize overhead power lines as nesting, hunting, resting, feeding, and sunning sites. The Service recommends the installation of underground, rather than overhead, power lines whenever possible/appropriate to minimize environmental disturbances. For all new overhead lines or modernization of old overhead lines, we recommend incorporating measures to prevent avian electrocutions. The publication entitled *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* includes many measures to reduce risk to birds including pole extensions, modified positioning of live phase conductors and ground wires, placement of perch guards and elevated perches, elimination of cross arms, use of wood (not metal) braces, and installation of various insulating covers. You may obtain this publication by contacting the Edison Electric Institute via their website at: <http://www.eei.org/resourcesandmedia/products/Pages/products.aspx>, or by calling 202-508-5000.

Please note that utilizing just one of the "*Suggested Practices . . .*" methods may not entirely remove the threat of electrocution to raptors. In fact, improper use of some methods may increase electrocution mortality. Perch guards, for example, may be only partially effective as some birds may still attempt to perch on structures with misplaced or small-sized guards and suffer electrocution as they approach too close to conducting materials. Among the most dangerous structures to raptors are poles that are located at a crossing of two or more lines, exposed above-ground transformers, or dead end poles. Numerous hot and neutral lines at these sites, combined with inadequate spacing between conductors, increase the threat of raptor electrocutions. Perch guards placed on other poles has, in some cases, served to actually shift birds to these more dangerous sites, increasing the number of mortalities. Thus, it may be necessary to utilize other methods or combine methods to achieve the best results. The same principles may be applied to substation structures.

Please also note that the spacing recommendation within the "*Suggested Practices . . .*" publication of at least 60 inches between conductors or features that cause grounding may not be protective of larger raptors such as eagles. This measure was based on the fact that the skin-to-skin contact distance on these birds (i.e., talon to beak, wrist to wrist, etc.) is less than 60 inches. However, an adult eagle's wingspan (distance between feather tips) may vary from 66 to 96 inches depending on the species (golden or bald) and gender of the bird, and unfortunately, wet feathers in contact with conductors and/or grounding connections can result in a lethal electrical surge. Thus, the focus of the above precautionary measures should be to a) provide more than 96 inches of spacing between conductors or grounding features, b) insulate exposed conducting

features so that contact will not cause raptor electrocution, and/or c) prevent raptors from perching on the poles in the first place.

Additional information regarding simple, effective ways to prevent raptor electrocutions on power lines is available in video form. *Raptors at Risk* may be obtained by contacting EDM International, Inc. at 4001 Automation Way, Fort Collins, Colorado 80525-3479, Telephone No. (970) 204-4001, or by visiting their website at:

<https://www.edmlink.com/component/zoo/item/video-raptors-at-risk>.

In addition to electrocution, overhead power lines also present the threat of avian line strike mortality. Particularly in situations where these lines are adjacent to wetlands or where waters exist on opposite sides of the lines, we recommend marking them in order to make them more visible to birds. For more information on bird strikes, please see *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* which, again, may be obtained by contacting the Edison Electric Institute via their website at

<http://www.eei.org/resourcesandmedia/products/Pages/products.aspx>, or by calling 202-508-5000.

While marking of power lines reduces line strike mortality, it does not preclude it entirely. Thus, marking of additional, existing, overhead lines is recommended to further offset the potential for avian line strike mortality. As noted above, the whooping crane is particularly susceptible to this type of mortality, and your project occurs within the whooping crane migratory corridor. Marking of existing lines elsewhere in the species' corridor is recommended.

Summary

Below we reiterate the list of items pertinent to the proposed project:

- Grasslands
 - avoid all grasslands, site facilities on cropland
- Wind Energy Guidelines
 - Apply *U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines*
https://www.fws.gov/ecological-services/es-library/pdfs/WEG_final.pdf
 - Avoid sensitive resources identified in survey reports
- Service Land Interests
 - Contact Long Lake WMD and Kulm WMD
- Eagle Guidance
 - Bald and Golden Eagle Protection Act (BGEPA)
 - *National Bald Eagle Management Guidelines*
<https://www.fws.gov/northeast/ecologicalservices/pdf/NationalBaldEagleManagementGuidelines.pdf>
 - *Eagle Conservation Plan Guidance, Module 1 – Land-based Wind Energy Version 2*

<https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds/collisions/communication-towers.php>

- Federal Aviation Administration *Obstruction Marking and Lighting Advisory Circular AC 70/7460-1L*:
https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_70_7460-1L_with_chg_1.pdf
- Overhead Power Lines:
 - *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006*: <http://www.eei.org/resourcesandmedia/products/Pages/products.aspx>
 - *Raptors at Risk* video: <https://www.edmlink.com/component/zoo/item/video-raptors-at-risk>
 - *Reducing Avian Collisions with Power Lines: The State of the Art in 2012*:
<http://www.eei.org/resourcesandmedia/products/Pages/products.aspx>

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide comments. If you have any questions on these comments, please contact Natalie Gates at (605) 224-8693, Extension 227.

Sincerely,



fw Scott Larson
Field Supervisor
North Dakota/South Dakota Field Offices

Literature Cited

Shaffer, J. A. and D. A. Buhl. 2016. Effects of wind-energy facilities on breeding grassland bird distributions. *Conservation Biology* 30(1):59-71.

Loesch, C. R., J. A. Walker, R. E. Reynolds, J. S. Gleason, N. D. Niemuth, S. E. Stephens, and M. A. Erickson. 2013. Effect of wind energy development on breeding duck densities in the Prairie Pothole Region. *Journal of Wildlife Management* 77(3):587-598.

Enclosure

cc: USFWS, Jared Newton, Long Lake WMD,
USFWS, Mick Erickson, Kulm WMD
ND PSC, Randy Christmann, Bismarck, ND ✓



United States Department of the Interior

FISH AND WILDLIFE SERVICE Mountain-Prairie Region



IN REPLY REFER TO:
FWS/R6
ES

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P.O. Box 25486, DFC
Denver, Colorado 80225-0486

STREET LOCATION:
134 Union Boulevard
Lakewood, Colorado 80228-1807

FEB 04 2010

Memorandum

To: Field Office Project Leaders, Ecological Services, Region 6
Montana, North Dakota, South Dakota, Nebraska, Kansas

From: Assistant Regional Director, Ecological Services, Region 6

Subject: Region 6 Guidance for Minimizing Effects from Power Line Projects Within the Whooping Crane Migration Corridor

This document is intended to assist Region 6 Ecological Services (ES) biologists in power line (including generation lines, transmission lines, distribution lines, etc.) project evaluation within the whooping crane migration corridor. The guidance contained herein also may be useful in planning by Federal action agencies, consultants, companies, and organizations concerned with impacts to avian resources, such as the Avian Power Line Interaction Committee (APLIC). We encourage action agencies and project proponents to coordinate with their local ES field office early in project development to implement this guidance.

The guidance includes general considerations that may apply to most, but not every, situation within the whooping crane migratory corridor. Additional conservation measures may be considered and/or discretion may be applied by the appropriate ES field office, as applicable. We believe that in most cases the following measures, if implemented and maintained, could reduce the potential effects to the whooping crane to an insignificant and/or discountable level. Where a Federal nexus is lacking, we believe that following these recommendations would reduce the likelihood of a whooping crane being taken and resulting in a violation of Endangered Species Act (ESA) section 9. If non-Federal actions cannot avoid the potential for incidental take, the local ES field office should encourage project proponents to develop a Habitat Conservation Plan and apply for a permit pursuant to ESA section 10(a)(1)(B).

Finally, although this guidance is specific to impacts of power line projects to the whooping crane within the migration corridor, we acknowledge that these guidelines also may benefit other listed and migratory birds.

If you have any questions, please contact Sarena Selbo, Section 7 Coordinator, at (303) 236-4046.

**Region 6 Guidance for Minimizing Effects from Power Line Projects
Within the Whooping Crane Migration Corridor**

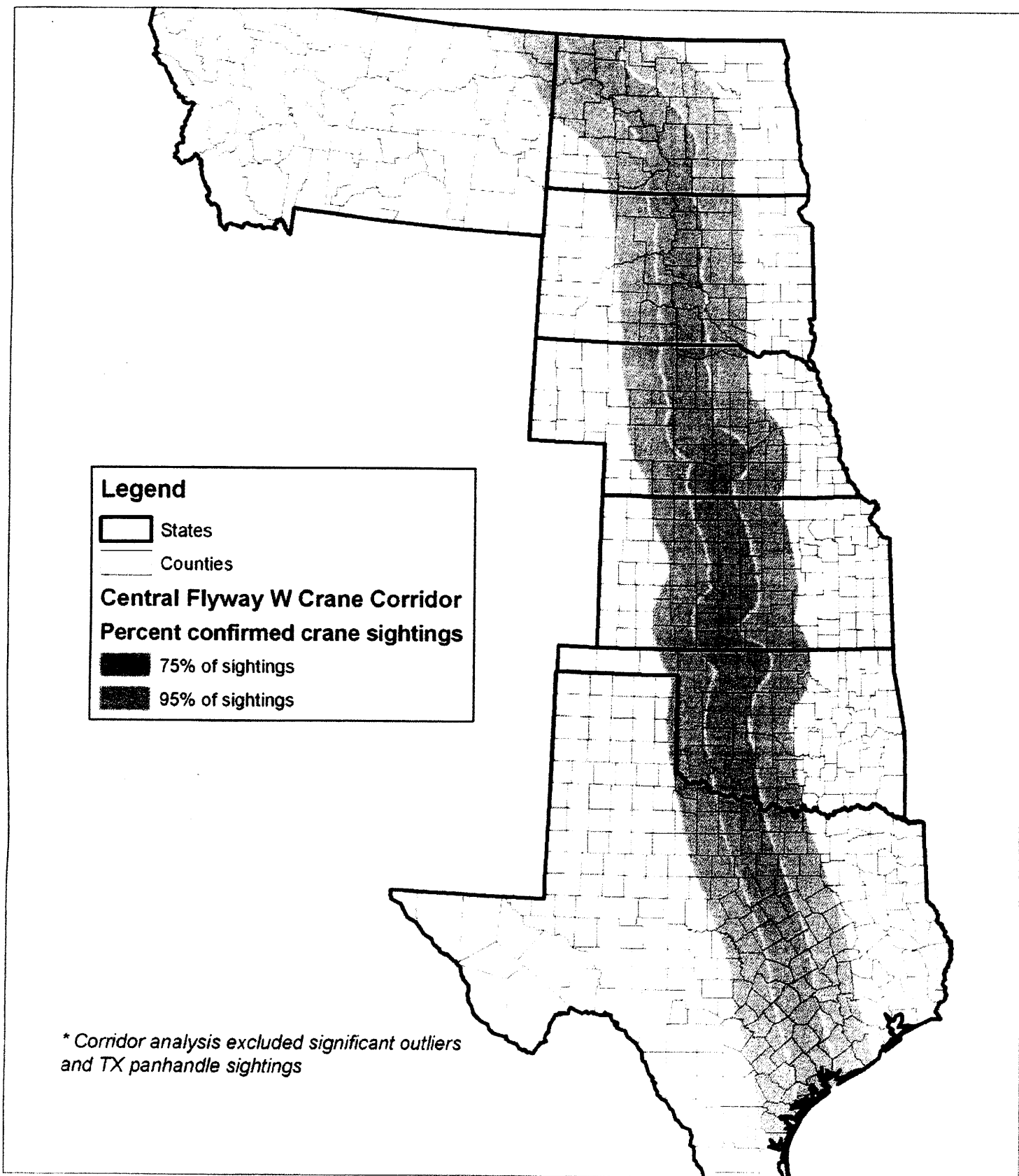
- 1) Project proponents should avoid construction of overhead power lines within 5.0 miles of designated critical habitat and documented high use areas (these locations can be obtained from the local ES field office).
- 2) To the greatest extent possible, project proponents should bury all new power lines, especially those within 1.0 mile of potentially suitable habitat¹.
- 3) If it is not economically or technically feasible to bury lines, then we recommend the following conservation measures be implemented:
 - a) Within the 95-percent sighting corridor (see attached map)
 - i) Project proponents should mark² new lines within 1.0 mile of potentially suitable habitat and an equal amount of existing line within 1.0 mile of potentially suitable habitat (preferably within the 75-percent corridor, but at a minimum within the 95-percent corridor) according to the U.S. Fish and Wildlife Service (USFWS) recommendations described in APLIC 1994 (or newer version as updated).
 - ii) Project proponents should mark replacement or upgraded lines within 1.0 mile of potentially suitable habitat according to the USFWS recommendations described in APLIC 1994 (or newer version as updated).
 - b) Outside the 95-percent sighting corridor within a State's borders

Project proponents should mark new lines within 1.0 mile of potentially suitable habitat at the discretion of the local ES field office, based on the biological needs of the whooping crane.
 - c) Develop compliance monitoring plans

Field offices should request written confirmation from the project proponent that power lines have been or will be marked and maintained (i.e., did the lines recommended for marking actually get marked? Are the markers being maintained in working condition?)

¹ Potentially suitable migratory stop over habitat for whooping cranes includes wetlands with areas of shallow water without visual obstructions (i.e., high or dense vegetation) (Austin & Richert 2001; Johns et al. 1997; Lingle et al. 1991; Howe 1987) and submerged sandbars in wide, unobstructed river channels that are isolated from human disturbance (Armbruster 1990). Roosting wetlands are often located within 1 mile of grain fields. As this is a broad definition, ES field office biologists should assist action agencies/applicants/companies in determining what constitutes potentially suitable habitat at the local level.

² Power lines are cited as the single greatest threat of mortality to fledged whooping cranes. Studies have shown that marking power lines reduces the risk of a line strike by 50 to 80 percent (Yee 2008; Brown & Drewien 1995; Morkill & Anderson 1991). Marking new lines and an equal length of existing line in the migration corridor maintains the baseline condition from this threat.



Legend

States

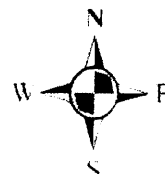
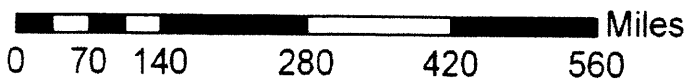
Counties

**Central Flyway W Crane Corridor
Percent confirmed crane sightings**

75% of sightings

95% of sightings

** Corridor analysis excluded significant outliers
and TX panhandle sightings*



Literature Cited

- Armbruster, M.J. 1990. Characterization of habitat used by whooping cranes during migration. U.S. Fish and Wildlife Service. Biological Report 90(4). 16 pp.
- Austin, E.A., and A.L. Richert. 2001. A comprehensive review of observational and site evaluation data of migrant whooping cranes in the United States, 1943-99. U.S. Geological Survey. Northern Prairie Wildlife Research Center, Jamestown, North Dakota, and State Museum, University of Nebraska, Lincoln, Nebraska. 157 pp.
- Avian Power Line Interaction Committee. 1994. Mitigating bird collisions with power lines: the state of the art in 1994. Edison Electric Institute. Washington, D.C. 99 pp.
- Brown, W.M., and R.C. Drewien. 1995. Evaluation of two powerline markers to reduce crane and waterfowl collision mortality. *Wildlife Society Bulletin* 23(2):217-227.
- Howe, M.A. 1987. Habitat use by migrating whooping cranes in the Aransas-Wood Buffalo corridor. Pp 303-311, in J.C. Lewis and J.W. Ziewitz, eds. Proc. 1985 Crane Workshop. Platte River Whooping Crane Habitat Maintenance Trust and U.S. Fish and Wildlife Service, Grand Island, Nebraska.
- Johns, B.W., E.J. Woodsworth, and E.A. Driver. 1997. Habitat use by migrant whooping cranes in Saskatchewan. *Proc. N. Am. Crane Workshop* 7:123-131.
- Lingle, G.R., G.A. Wingfield, and J.W. Ziewitz. 1991. The migration ecology of whooping cranes in Nebraska, U.S.A. Pp 395-401 in J. Harris, ed. Proc. 1987 International Crane Workshop, International Crane Foundation, Baraboo, Wisconsin.
- Morkill, A.E., and S.H. Anderson. 1991. Effectiveness of marking powerlines to reduce sandhill crane collisions. *Wildlife Society Bulletin* 19:442-449.
- Yee, M.L. 2008. Testing the effectiveness of an avian flight diverter for reducing avian collisions with distribution power lines in the Sacramento Valley, California. California Energy Commission; Publication CEC-500-2007-122.