

Lake Benton Wind Energy Facility Bird and Bat Conservation Strategy



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1.0 INTRODUCTION

ALLETE Clean Energy owns and operates the Lake Benton Wind Energy Facility (Project) in Lincoln County, Minnesota. This Project was permitted by the Northern States Power Company in 1995. The permit was amended in 1997. The project became operational in 1998. ALLETE Clean Energy purchased the Project from AES Corp. in January 2014. The permit was amended a second time in November 2017. The Project includes 139 wind turbines that have a total generating capacity of 104.25 megawatts (MW). In consideration of the recent guidance documents released by the U.S. Fish and Wildlife Service (USFWS) including the *Land-Based Wind Energy Guidelines* (WEG, USFWS 2012), the *Eagle Conservation Plan Guidance: Module 1 – Land-based Wind Energy, Version 2* (ECPG, USFWS 2013), and *Northern Long-eared Bat Interim Conference and Planning Guidance* (USFWS 2014), this Bird and Bat Conservation Strategy (BBCS) describes ALLETE Clean Energy’s process to avoid and/or minimize potential impacts to birds and bats that may result from the operation of the Project.

Although these guidance documents were all released after the Project began operations, ALLETE Clean Energy is interested in assessing and minimizing ongoing risk of adverse impacts to species of conservation concern. Specifically, this BBCS document was developed to:

1. Consolidate documentation of steps already taken to avoid and minimize potential effects on birds and bats during Project planning and development; and
2. Identify and implement steps to further reduce the potential for avian and bat fatalities or other potential adverse effects on birds and bats at the Project.

1.1 Project Description

The Project consists of 139 Zond 750 kilowatt (kW) turbines, with the capacity of producing 104.25 MW of power. Each turbine has a 174 ft (53 m) hub height and either a 157.5 ft or 164.1 ft (48 or 50 m) rotor diameter. The Project area is comprised of approximately 9,931 acres of private land in Lincoln County, MN. Based on U.S. Geological Survey (USGS) National Land Cover Data (2011), the majority of the land cover of the Project is cultivated crops (approximately 60.5%). The Project also contains portions of other land cover types including herbaceous (27.2%), hay/pasture (7.0%), and developed open space (4.3%). Table 1 and Appendix E Figures 5a & 5b present land use/cover types found within the project area.

Table 1. Land cover types present within the Lake Benton Study Area

Land Use/Cover	Project Acres	Percent of Total
Cultivated Crops	6,012.1	60.5%
Herbaceous	2,705.3	27.2%
Hay/Pasture	697.7	7.0%
Developed, Open Space	426.9	4.3%
Emergent Herbaceous Wetlands	40.2	0.4%
Deciduous Forest	21.1	0.2%
Developed, Medium Intensity	14.0	0.1%
Developed, Low Intensity	10.0	0.1%
Open Water	4.9	<0.1%
Barren Land	0.9	<0.1%
Total	9,933.1	100%

Data: USGS NLCD 2011

1.2 Project Siting, Construction and Operations Best Management Practices

The siting and development process for the Project occurred prior to development of the USFWS WEG (USFWS 2012). However, information gathered during pre-construction studies and the Large Wind Energy Conversion System (LWECS) permitting process was used during the turbine and infrastructure siting process to minimize potential impacts to birds and bats and their habitats. Prior to designing the facility layout, setback and constraint information was incorporated as part of the LWECS Site Permit process with the Public Utility Commission (PUC). This information was used to establish setbacks and inform site design.

1.2.1 Project Siting Measures Used to Reduce Impacts

- The Project is sited in a heavily cultivated landscape to minimize impacts to wildlife and habitats.
- Standard setbacks for non-participating landowners, residences, environmental areas (such as state-managed lands), noise, airports, etc. were implemented.
- Existing roads and field accesses were used or improved for access roads when practicable.
- Turbines were sited to avoid impacts to wetlands, and access roads and other infrastructure were sited to avoid and minimize wetland impacts to the greatest extent possible.

- A Native Prairie plan was developed to identify native prairie and document methods that could be used to avoid impacts, and if impacts were not avoidable, document mitigation measures. The Minnesota Environmental Quality Board (MEQB) permit required the project to work with Minnesota Department of Natural Resources (DNR) to prepare this prairie protection plan and management plan, including mitigation provisions for any adverse impacts caused by the permitted facility. Unavoidable impacts were to be mitigated by restoration, management of other degraded native prairie, conveyance of conservation easements or other means agreed to by the permittees and the DNR. The permittees and DNR, together with The Nature Conservancy, reached agreement that the permittee would acquire 120 acres for native prairie restoration. The permittee acquired 146.5 acres adjacent to the existing Hole in the Mountain preserve and transferred it to The Nature Conservancy for its restoration to native prairie and addition to the preserve.

1.2.2 Project Design Used to Reduce Impacts

- Wind turbines were designed with tubular towers and no external ladders or platforms on the towers or nacelles were used to minimize bird perching and nesting opportunities.
- The number of turbines with visibility lighting was minimized, within Federal Aviation Administration (FAA) requirements.
- FAA-approved lighting uses the shortest allowable flash duration, the minimum allowed flashes per minute, and all lights flash at the same time so that nocturnal migrating birds are not disoriented by lights.
- Lighting at the operations and maintenance (O&M) facility, Project substation, and other installations has been minimized and designed so that light is directed downward (toward the access or work area) and is hooded to prevent light from shining into the sky and attracting or disorienting nocturnal migrants. Motion or heat-activated lighting is used where practicable.

1.2.3 Operational Procedures to Minimize Impacts

- During normal operational activities, if facility personnel discover carrion on or near Project facilities, reasonable measures are taken to remove this carrion to minimize attracting predators/scavengers such as raptors and vultures.
- A Wildlife Response and Reporting System (WRRS) has been implemented to establish protocols for identifying and communicating bird and bat fatalities.

1.3 Key Avian and Bat Regulations

1.3.1 Federal Endangered Species Act

Certain species at risk of extinction, including many birds and bats, are protected under the federal Endangered Species Act (ESA) of 1973, as amended. The ESA 1973 defines and lists species as “endangered” and “threatened” and provides regulatory protection for the listed species. The federal ESA provides a program for conservation and recovery of threatened and endangered species. Section 9 of the federal ESA prohibits the “take” of species listed by USFWS as threatened or endangered. Take is defined as follows: “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct.” Section 10(a) of the federal ESA includes provisions for the authorization of take that is incidental to, but not the purpose of, otherwise lawful activities. Section 10(a)(1)(B) permits (Incidental Take Permits) may be issued if take is incidental and does not jeopardize the survival and recovery of the species. For species that are listed as threatened under the ESA, 4(d) rules can be implemented, which are used to incentivize conservation actions and streamline the regulatory process for minor impacts, and usually include descriptions of what types of take of the species are and are not prohibited.

1.3.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, capture, kill, or possess any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and Russia (and other countries of the former Soviet Union; MBTA 1918). Most birds (except for introduced species and non-migratory game birds) within the U.S. and the Project area are protected under the MBTA. The birds, occupied nests, and the contents of the nest (eggs or chicks) within the Project area are afforded protection pursuant to the MBTA. Due to the potential for resident and migratory birds within the Project area, compliance with the MBTA has been considered in the development of this BBCS. Unlike ESA and Bald and Golden Eagle Protection Act (BGEPA), no permits are currently available to authorize incidental take of birds under the MBTA.

1.3.3 Bald and Golden Eagle Protection Act

The purpose of the Bald and Golden Eagle Protection Act (BGEPA; 16 USC 668–668c, as amended), administered by the USFWS, is to protect bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), including their nests, eggs, and parts (BGEPA 1940). The BGEPA states that “no person shall take, possess, sell,

purchase, barter, offer for sale, purchase or barter, transport, export, or import any bald or golden eagle alive or dead, or any part, nest or egg without a valid permit to do so.” BGEPA defines the take of an eagle to include “...to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest or disturb.” The term “disturb” is defined in regulations found at 50 C.F.R. § 22.3 to include 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.

BGEPA authorizes the Secretary of the Interior to permit the take of bald or golden eagles for several defined purposes, including when “necessary to permit the taking of such eagles for the protection of wildlife or of agricultural or other interests in any particular locality.” Based on this authority, the USFWS published a final rule (Eagle Permit Rule) on September 11, 2009 (see 50 C.F.R. Parts 13 and 22) the USFWS set in place rules establishing two new permit types: 1) individual permits that can be authorized in limited instances of disturbance and in certain situations where other forms of take may occur, such as human or eagle health and safety; and 2) programmatic permits that may authorize incidental take that occurs over a longer period of time or across a larger area (USFWS 2009). On December 16, 2016, the USFWS issued a rule that includes final revisions to the regulations for eagle take permits and eagle nest take permits. The changes were effective January 17, 2017, and include changes to permit issuance criteria, duration (allowing a 30-year permit term), compensatory mitigation standards, and permit application requirements and codifies and further defines the USFWS-approved protocols for pre-construction eagle use surveys (referencing the ECPG) and post-permit fatality monitoring requirements.

The Eagle Permit Rule authorizes take of bald eagles and golden eagles where take: (1) is compatible with the preservation of the bald and golden eagle; (2) is associated with and not the purpose of an otherwise lawful activity; and (3) cannot practicably be avoided (50 C.F.R. § 22.26). Specific to wind energy operations, the USFWS issued its *Eagle Conservation Plan Guidance Module 1 – Land-based Wind Energy Version 2* to provide specific recommendations on assessing eagle risk and taking steps to avoid, minimize, and mitigation potential impacts to eagles consistent with BGEPA (USFWS 2013).

1.3.4 Minnesota Threatened and Endangered Species Laws

The 2010 Minnesota Statutes, specifically the Protection of Threatened and Endangered Species (Minn. Stat. 84.0895), includes the language “Notwithstanding any other law, a person may not take, import, transport, or sell any portion of an endangered species of wild animal or plant, or sell or possess with intent to sell an article made with any part of the skin, hide, or parts of an endangered species of wild animal or plant, except as provided in subdivisions 2 and 7.” The Statute directs the Commissioner of the Minnesota Department of Natural Resources (MDNR) to develop lists of endangered species, threatened species, and species of concern.

1.4 Alignment with USFWS Wind Energy Guidelines and Eagle Conservation Plan Guidance

Until recently, the USFWS had been recommending, and many wind energy companies had been developing, Avian and Bat Protection Plans (ABPP) for wind projects. In Minnesota, it is now a standard requirement of the LWECS Site Permit to develop an ABPP for the operation of the Project; however, at the time the Lake Benton Wind Energy Facility went through the LWECS permit process (1995 - 1997), no ABPP was required. With publication of the final WEG, the USFWS began recommending development of a Bird and Bat Conservation Strategy (BBCS) instead of an ABPP (USFWS 2012). While the components may be generally the same, the BBCS is a mechanism by which wind energy companies document the studies, analyses, agency input, and decisions in navigating through the WEG to help avoid and minimize impacts to environmental resources.

This Project was developed and permitted prior to the WEG; however, the efforts completed in siting, studying, analyzing, reviewing, and coordinating with state and federal officials generally align with the WEG tiered approach. This BBCS briefly describes the efforts completed during pre-construction (generally corresponding to Tiers 1 – 3 of the WEG). The bulk of the BBCS focuses on what the Project has done in Tier 4 as well as adaptive management measures that will occur throughout operation of the Project.

As described in Section 1.3.3, the USFWS issued its *Eagle Conservation Plan Guidance* in April 2013 to assist developers in addressing eagle concerns associated with wind energy projects. As with the WEG, the USFWS’s eagle guidance came out after the Project was developed, permitted, and constructed. Although the eagle guidance came out after the Project was operational, this BBCS addresses the recommendations included in the USFWS’s eagle guidance. ALLETE Clean Energy’s

commitments to assess risk, avoid and minimize impacts, monitor for potential effects, and respond to potential concerns related to eagles are clearly described throughout this BBCS (see Sections 3 and 5).

2.0 PRE-CONSTRUCTION AND CONSTRUCTION SUMMARY

2.1 Pre-Construction

The WEG outlines a tiered approach to assessing suitability and risks to wildlife at a potential wind resource area. The “tiered” approach ensures that sufficient data are collected to enable project proponents to make informed decisions about continued development of a proposed project (USFWS 2012).

2.1.1 Pre-Construction Siting Considerations

As stated above, the Project was sited and permitted prior to development of the WEG. However, pre-construction siting was considered to avoid and minimize impacts to wildlife and sensitive habitats.

Most turbines were placed in cultivated fields to avoid impacts to high quality wildlife habitat. Preliminary design involved underground cable crossings of several small wetlands; as part of final design, cable alignments were revised and assessed to avoid impacting the wetlands. Additionally, collector lines and other project infrastructure were buried where practicable, to minimize wildlife collision risk.

2.1.2 Pre-Construction Surveys

In 1996, prior to construction and operation of the Lake Benton I Project, WEST was contracted by Northern States Power Company to develop and implement an avian monitoring protocol for the Buffalo Ridge Wind Resource Area (WRA), an area that encompasses the Lake Benton Project. The primary objective of this study was to evaluate risk to birds from windpower development in the Buffalo Ridge WRA. One hundred meter radius point count surveys were conducted to estimate relative abundance, species composition, flight behavior, habitat use, and relative risk from 15 March to 15 November, 1996 to 1999 at turbine locations and at randomly selected stations within the Buffalo Ridge WRA.

Researchers documented 218 species of birds in the Buffalo Ridge WRA during the 4-year study. Based on point count survey data, avian relative use over the Buffalo Ridge WRA was highest in woodland habitat, followed by wetlands, pastures, hayfields, Conservation Reserve Program lands, and croplands. Appendix A contains detailed

results of the pre-construction avian use surveys that were conducted at the Buffalo Ridge WRA

2.1.3 Protected Species

One bat species (northern long-eared bat) and three bird species (bald eagle, Henslow’s sparrow and loggerhead shrike) listed in Table 2 are protected by federal or state law and have the potential to occur in the Project area based on USFWS and DNR County lists; bald eagles and loggerhead shrike were documented in the pre-construction avian use surveys conducted at the Buffalo Ridge WRA. Three additional species observed as part of the 1996 to 1999 avian use surveys are listed as endangered or threatened by the state of Minnesota or are protected by BGEPA: Wilson’s phalarope, horned grebe, and common tern. Most of these birds were observed during the spring of fall migration and were likely migrants. Measures described in Sections 3 and 5 address how ALLETE Clean Energy will manage risks for these species.

Table 2. Bats and birds protected by federal or state law that are likely to occur in Lincoln County and/or have been documented at the Lake Benton I Project area.

Common Name	Scientific Name	Status	Detected during pre-construction surveys ^a
MAMMALS			
Northern Long-Eared Bat	<i>Myotis septentrionalis</i>	FT	N/A
BIRDS			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	Yes
Henslow’s Sparrow	<i>Ammodramus henslowii</i>	SE	No
Loggerhead Shrike	<i>Lanius ludovicianus</i>	SE	Yes
Wilson’s Phalarope	<i>Phalaropus tricolor</i>	ST	Yes
Common Tern	<i>Sterna hirundo</i>	ST	Yes
Horned Grebe	<i>Podiceps auritus</i>	SE	Yes

Source: USFWS County Distribution List. Minnesota Department of Natural Resources. (FT= Federally Threatened, BGEPA= Bald and Golden Eagle Protection Act, ST= State Threatened, SE= State Endangered)

^aInformation based on Johnson et. al. 2000a

2.2 Construction

As stated in Section 1.2.3, best management practices were developed to avoid and minimize impacts during construction. All employees and contractors were informed of all permit conditions, including those that avoided and minimized impacts to wildlife and wildlife habitats during construction and reclamation activities.

3.0 POST-CONSTRUCTION: TIER 4

The WEG recognize that projects are in various states of development and/or operations. This includes projects operating prior to finalization of the WEG. The WEG specify that “for projects initiated prior to publication, the developer should consider where they are in the planning process relative to the appropriate tier and inform the Service of what actions they will take to apply the Guidelines” (USFWS 2012).

According to the WEG, “during post-construction tiers (including Tier 4), developers are assessing whether actions taken in earlier tiers to avoid and minimize impacts are successfully achieving the goals and, when necessary, taking additional steps to compensate for impacts” (USFWS 2012). The specific questions to be investigated in Tier 4 are:

1. What are the bird and bat fatality rates for the project?
2. What are the fatality rates of species of concern?
3. How do the estimated fatality rates compare to the predicted fatality rates?
4. Do bird and bat fatalities vary within the project site in relation to site characteristics?
5. How do the fatality rates compare to the fatality rates from existing projects in similar landscapes with similar species composition and use?
6. What is the composition of fatalities in relation to migrating and resident birds and bats at the site?
7. Do fatality data suggest the need for measures to reduce impacts?

Post-construction fatality surveys were conducted at the Project prior to ALLETE Clean Energy’s purchase of the Project, as summarized below and described in more detail in Appendix A, B, and C.

3.1 Formal Post-Construction Fatality Monitoring

Northern States Power Company, in coordination with WEST and South Dakota State University, developed a multi-year study to evaluate the fatality risk to birds and bats and evaluate possible correlations between turbine site characteristics and estimated fatality rates at the overall Buffalo Ridge WRA, an area that encompasses the Lake Benton Project. A total of six years of surveys were conducted, from 1994 to 1999; the fatality surveys for this study at the Lake Benton I Project occurred after the Project was operational in 1998. Two additional follow-on studies were completed with further post construction monitoring for bats at the Lake Benton I site between years 2000 and

2002. The surveys are summarized below, and the full reports are included in Appendix A, B, and C.

3.1.1 Methods

The fatality monitoring study consisted of the following components:

- 1) standardized carcass surveys at turbines,
- 2) searcher efficiency trials to estimate the percentage of carcasses found by searchers, and
- 3) carcass removal trials to estimate the length of time that a carcass remained in the field for possible detection.

All casualties located within areas surveyed, regardless of species, were recorded and a cause of death was determined if possible. The total number of bat and bird casualties (including dead and injured bats and birds) were estimated by adjusting for search frequency, removal bias (length of stay in the field), searcher efficiency bias (percent found), and area searched. Appendix A contains the details on sample size, search area and frequency for the surveys, along with the approach to searcher efficiency and carcass removal trials.

3.1.2 Results

Estimates of facility-related wildlife fatalities are based on:

- 1) observed number of carcasses found during standardized searches during the monitoring year;
- 2) probability of detection including non-removal rates, expressed as the estimated average probability a carcass is expected to remain in the study area and be available for detection by the searchers during removal trials, and searcher efficiency, expressed as the proportion of placed carcasses found by searchers during searcher efficiency trials.

Fatality estimates were calculated for bats and birds. Appendix A contains detailed discussions of the statistical methods used to calculate the fatality rates.

3.1.2.1 Bird and Bat Fatalities

During the 4-year study, from 1996–1999, a total of 55 avian fatalities comprised of at least 31 species were found across the entire Buffalo Ridge WRA, associated with

operational wind facility features. 22 of the 55 fatalities were associated with the Lake Benton I wind site, 20 of which were found between 1998 and 1999, after commercial operation of the site. Avian fatalities associated with turbines across the entire Buffalo Ridge WRA were comprised of 76.4% passerines, 9.1% waterfowl, 5.5% waterbirds, 5.5% upland gamebirds, 1.8% raptors, and 1.8% shorebirds. No state or federally listed threatened or endangered bird species and no eagles were documented as fatalities in the Buffalo Ridge WRA or at the Lake Benton I wind site.

A total of 184 bat fatalities were found in 1998 and 1999 across the entire Buffalo Ridge WRA, with 132 fatalities associated with the Lake Benton I wind site. Most bats were tree bats, with hoary bats being the most common fatality. No state or federally listed threatened or endangered bat species were documented as fatalities in the Buffalo Ridge WRA or at the Lake Benton I wind site, although one bat fatality, the Big Brown Bat, is now listed as a State of Minnesota species of concern.

Appendix A contains additional details on the 1996-1999 study, and the characteristics and distribution of bird and bat fatalities documented at Buffalo Ridge WRA and the Lake Benton I wind site.

The follow-on bat studies in years 2000, and 2001-2002, found a total of 32, 47, and 33 bat fatalities at the Lake Benton I wind site, respectively, with no state or federally listed threatened or endangered bat species documented. Either one or two bat fatalities each of these years were cited for the Big Brown Bat, which is now listed as a State of Minnesota species of concern. These studies are provided in Appendix B and Appendix C.

3.1.2.2 Adjusted Fatality Estimates

Annual mortality of birds was estimated in the 1996-1999 study to be approximately 912 birds per year across the entire Buffalo Ridge WRA, and 324 across the Lake Benton I wind site, with an additional annual mortality of approximately 300 birds per year for every additional 100 turbines built at Buffalo Ridge WRA.

Annual mortality of bats was estimated in the 1996-1999 study to be approximately 525 bats per year across the entire Buffalo Ridge WRA, and 254 across the Lake Benton I wind site, with an additional annual mortality of approximately 187 bats per year for every additional 100 turbines built at Buffalo Ridge WRA. Furthermore, bat fatalities increased with decreased distance to wetlands.

Appendix A contains additional details on the characteristics and distribution of bird and bat fatalities documented at Buffalo Ridge WRA and the Lake Benton I wind site.

The follow-on bat studies for years 2000, 2001, and 2002, show an average estimated annual bat mortality of 277 bats per year for the Lake Benton I wind site across these three years. These studies are provided in Appendix B and Appendix C.

3.1.2.3 Summary

Compared to several other wind facilities operating in the U.S., data collected from 1996–1999 indicate that avian mortality appears to be low at Buffalo Ridge WRA. Publicly available bat fatality data in Minnesota and South Dakota report a range of bat fatality of 0.16 to 15.85 bats/turbine/year, with the majority of facilities having estimated rates of 1 to 4 bats/turbine/year. As part of the multi-year set of studies from 1996 to 2002 at the Lake Benton I wind site, the average annual bat fatality number is 1.87 bats/turbine/year, a number below the midpoint of the range when compared to other studies from the region.

3.2 Incidental Monitoring

3.2.1 Training of On-Site Staff

All operations personnel are trained to identify potential wildlife conflicts and the proper response. This training includes sensitivity to birds and other wildlife. An incidental reporting process has been developed for operations personnel ensuring they can document bird or bat casualties during routine maintenance work and at other times that they are within the Project area.

In addition to incidental fatality monitoring, operations personnel will be trained to identify bald eagles and to be sensitive to relative use rates of bald eagles and to look for eagle casualties while driving between turbines and conducting turbine maintenance. This information will be used for the life of the Project to continually maintain a relative sense of bald eagle use in the Project area so that modifications can be implemented as necessary.

On-site staff has also been trained to reduce driving speeds to less than 30 miles per hour to minimize wildlife collision risk.

3.2.2 Turbine Cut in Speed Evaluation

Due to the vintage of the Project's equipment, it is not technically possible or economically feasible to employ various current avian and bat impact reduction strategies such as limiting rotor idling and/or adjusting cut-in speeds. ALLETE Clean Energy will continue to evaluate new technologies for retrofitting the Project's turbines

as they become available for the make and model of equipment to determine if these could be done economically.

3.2.3 Injured Wildlife Handling and Reporting Protocol

Any injured wildlife observed during operations of the Project will be left in place until ALLETE Clean Energy's primary biological/ecological representative has been contacted (see Section 6.3). ALLETE Clean Energy will then decide the most appropriate course of action depending on the condition and species of injured animal discovered. ALLETE Clean Energy will promptly notify the necessary Wildlife regulatory agencies (including Minnesota Public Utilities Commission staff) of all injured raptors, waterfowl, waterbirds, federally- or state-listed bird species, and federally- or state-listed bats. The appropriate rehabilitation center or other approved facility will be notified as directed by necessary law enforcement personnel. Figure 2 illustrates the process for handling and reporting any injured wildlife documented at the Project.

3.2.4 Carcass Handling and Reporting Protocol

Any wildlife carcasses observed during operations of the Project will be left in place until ALLETE Clean Energy's primary biological/ecological representative has been contacted. Figure 3 illustrates the process for handling and reporting any wildlife fatalities documented at the Project.

ALLETE Clean Energy's Lake Benton Wildlife Reporting System supporting documentation can be found in Appendix D.

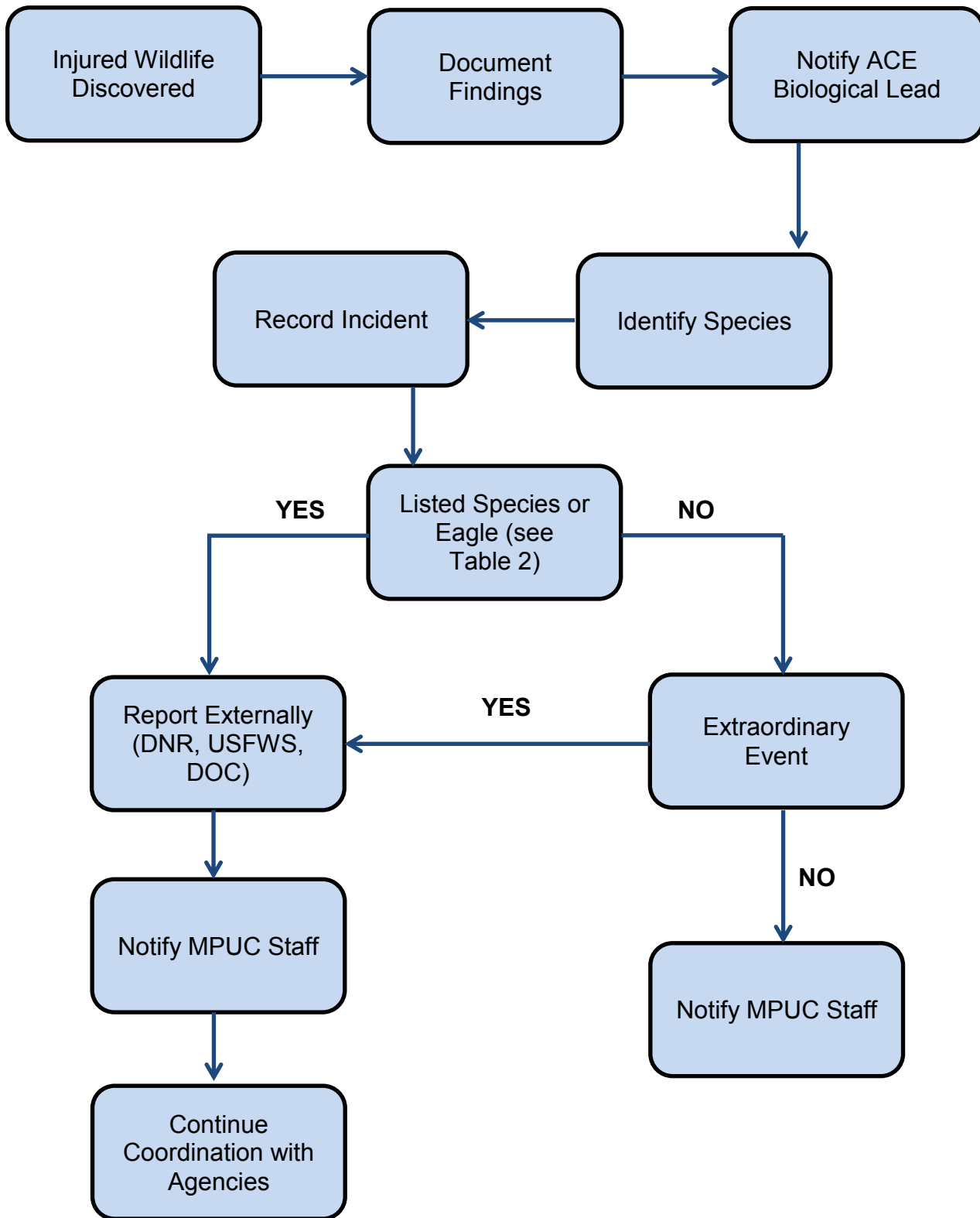


Figure 2. Flowchart of process if injured wildlife discovered.

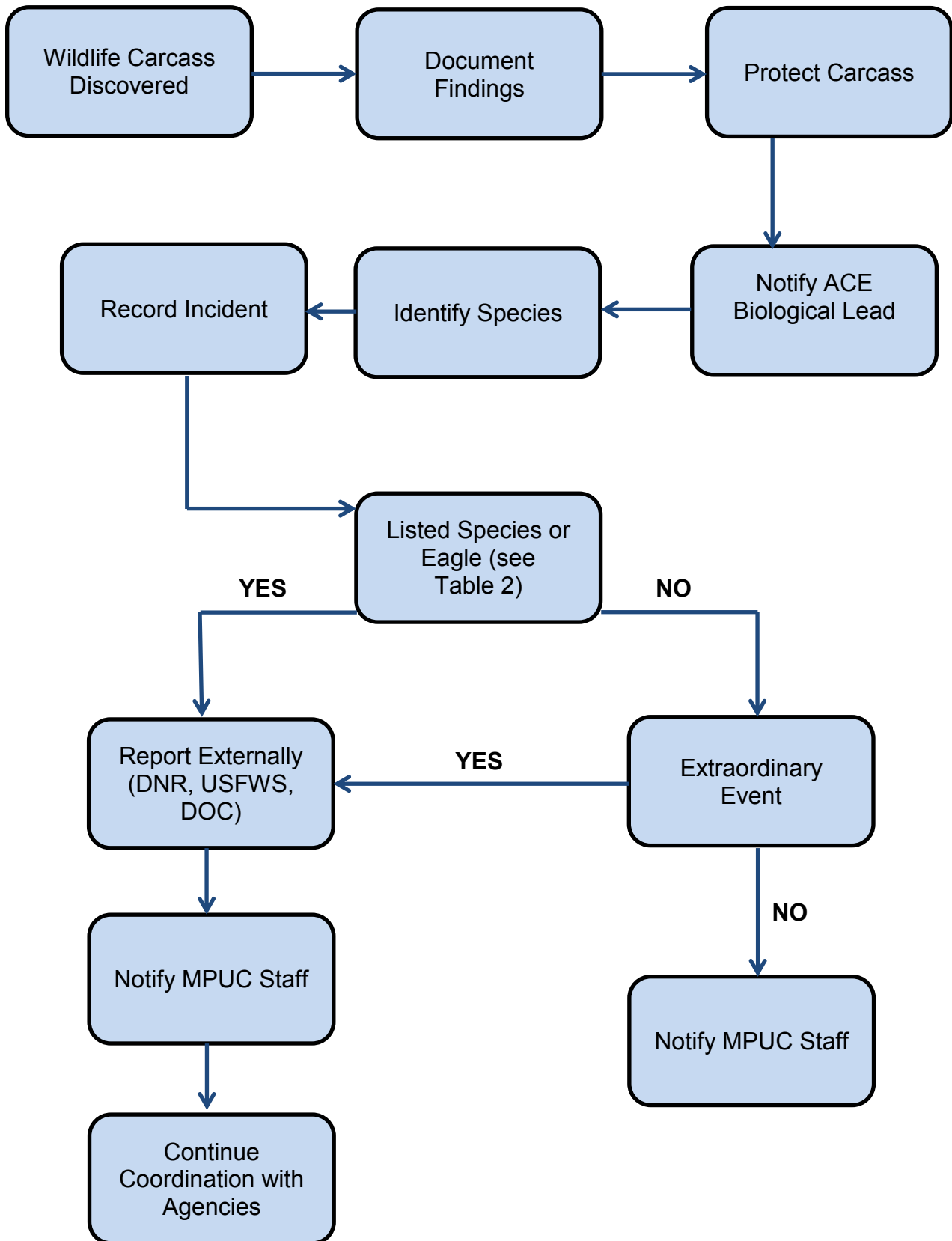


Figure 3. Flowchart of process if wildlife carcass discovered.

3.3 Agency Coordination – Tier 4

The results of multiple years of post-construction monitoring at Buffalo Ridge WRA (including the information collected at the Project) have been made available to the Department of Commerce, the USFWS, and the DNR.

4.0 RESEARCH: TIER 5

In addition to the Tiers 1-4 described above, the WEG contain a *Tier 5 Other Post-Construction Studies*. In general, the studies identified in Tier 5 are research-related and “will not be necessary for most wind energy projects”. Given that the Project’s pre-construction and post-construction studies indicate that the Project is not likely to cause significant adverse impacts, no Tier 5 studies are planned.

5.0 ADAPTIVE MANAGEMENT AND OPERATIONS MEASURES

Within the WEG, the Department of the Interior defines adaptive management as “an iterative decision process that promotes flexible decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Comprehensively applying the tiered approach embodies the adaptive management process” (USFWS 2012). The WEG further note that adaptive management is unlikely to be needed at most wind facilities if they are sited in accordance with the tiered approach. Nevertheless, ALLETE Clean Energy recognizes the value of applying this approach to its Project activities that include some uncertainty. As such, ALLETE Clean Energy has incorporated an adaptive approach for the conservation of wildlife potentially impacted by the Project.

Based on the general location of the Project (highly impacted agriculture landscape), and results of six years of fatality surveys at the overall Buffalo Ridge WRA, no significant adverse impacts are anticipated from the Project. The estimated adjusted fatality rates for birds are lower than multiple other wind facilities in the U.S. Also, the estimated adjusted fatality rates for bats are lower than multiple other wind facilities in Minnesota and South Dakota. However, adaptive management measures could be considered in the future to further avoid, minimize, or compensate for unanticipated and significant project impacts to wildlife. Thresholds for considering a future adaptive response will include:

- mortality of an eagle, or species listed as endangered/threatened under the federal Endangered Species Act or Minnesota’s Endangered Species Statute; or

- significant levels of mortality of unlisted species of birds or bats. Significance will be determined by qualified biologists and will be based on the latest information available, including the most recent data on species' population sizes and trends. For example, even relatively high levels of mortality of the most common species may not be significant. Conversely, lower levels of mortalities of less common species may be of more concern, particularly if these species are of conservation concern (e.g., DNR Special Concern Species, USFWS Birds of Conservation Concern, etc.).

Some of the adaptive management measures options that could be considered depending on the results of upcoming wildlife surveys, continued incidental operational monitoring, and taking into account economic feasibility¹ include:

- regular removal of livestock or big game carcasses from Project area;
- prey-base habitat management (e.g., removal of rock/brush piles found in proximity to turbines); or
- installation or modifications of anti-perching, anti-nesting devices, or electrocution protection devices on “problem” Project facilities.

Finally, ALLETE Clean Energy will consider implementing adaptive management measures if the status of any species potentially impacted by the Project changes, such as if any species become listed under federal or state protected species regulations. In particular the status of the federally threatened northern long-eared bat will be monitored, and the BBCS will be updated as appropriate. On January 14, 2016, the USFWS published a final 4(d) rule that goes into effect on February 16, 2016. Under the final 4(d) rule, most incidental take of NLEB is allowed, including that which occurs as a result of the operation of wind turbines. If the 4(d) rules or the status of the northern long-eared bat change during the operations of the Project, ALLETE Clean Energy will assess the risks to the species from the Project accordingly and update the BBCS, coordinating with the USFWS as appropriate.

6.0 IMPLEMENTATION OF THE BBCS

6.1 Document Availability

This BBCS will be maintained by ALLETE Clean Energy's environmental representative and a copy of the BBCS will be kept on-site throughout operations of the Project.

¹ Once a project is operational there is a fixed amount of capital expenditure and the only available source of funding is from operational budgets, which must be within the economic parameters of the Project.

6.2 Reporting

According to the November 2017 site permit amendment;

- The Permittee shall file an Avian and Bat Protection Plan (ABPP) within 6 months of the issuance of the amended site permit which shall be approved by the MPUC Executive Secretary. This Bird and Bat Conservation Strategy (which is the more current form of ABPPs) was prepared for this purpose.
- The Permittee shall file with the Commission by the 15th of March following each year of operation an annual report detailing the findings of its annual audit of ABPP practices per the amended site permit.
- The Permittee shall submit quarterly avian and bat reports to the Commission, DNR and USF&WS commencing upon approval of the ABPP with such reports being due by the 15th of January, April, July and October per the amended site permit.

The MN PUC, MN DNR, and the USFWS will be notified within 24 hours of the discovery of any of the following:

- five or more dead or injured birds or bats within a five day reporting period; or
- one or more dead or injured state threatened, endangered, or species of special concern; or
- one or more dead or injured federally listed species, including species proposed for listing; or
- one or more dead or injured bald or golden eagle(s).

6.3 Primary Contact

Key resource personnel associated with this BBCS include the following:

ACE Clean Energy Primary Biological/Ecological Representative:

- Safety and Environmental Compliance: Matthew Riel
 - Mobile: 570 309-4503
 - Office: 218-355-3293
 - Email: mriel@alletecleanenergy.com

ALLETE Clean Energy Primary Biological/Ecological Representative:

- Siting and Permitting: Daniel McCourtney
 - Mobile: 218-428-5089
 - Office: 218-355-3515
 - Email: dmccourtney@allete.com

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Appendix A. Avian Monitoring Studies at the Buffalo Ridge, Minnesota Wind Resource Area: Results of a 4-Year Study

Cover page provided here.

The full report can be found at the following website:

<http://www.batsandwind.org/pdf/avian%20monitoring%20at%20buffalo%20ridge.pdf>

FINAL REPORT

**AVIAN MONITORING STUDIES AT THE BUFFALO RIDGE, MINNESOTA WIND
RESOURCE AREA: RESULTS OF A 4-YEAR STUDY**

Prepared For:

Northern States Power Company
414 Nicollet Mall, 8th Floor
Minneapolis, Minnesota 55401

Prepared By:

Gregory D. Johnson, Wallace P. Erickson, M. Dale Strickland, Maria F. Shepherd and
Douglas A. Shepherd



Western EcoSystems Technology, Inc.
2003 Central Avenue
Cheyenne, Wyoming 82001

September 22, 2000

Appendix B. Wind-Turbine Related Bat Mortality in Southwestern Minnesota

Cover page provided here.

The full report can be found at the following website:

http://files.dnr.state.mn.us/eco/nongame/projects/consgrant_reports/2000/2000_krenz_mcmillan.pdf

FINAL REPORT:

WIND-TURBINE RELATED BAT MORTALITY IN SOUTHWESTERN MINNESOTA

John D. Krenz, Department of Biological Sciences, Minnesota State University, Mankato MN
56001 USA

Brock R. McMillan, Department of Biological Sciences, Minnesota State University, Mankato
MN 56001 USA

To: Joan Galli, Non-game Wildlife Specialist, Minnesota Department of Natural Resources, Box
7, 500 LaFayette Road, St. Paul MN 55155 USA

Date: 12 December 2000

Grant period: 1 year (1 July 2000 -- 30 June 2001)

Grant amount: \$ 4,500

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**Appendix C. Bat Interactions With Wind Turbines at the Buffalo Ridge,
Minnesota Wind Resource Area**

Cover page provided here.

The full report can be found at the following website:

<https://mn.gov/commerce/energyfacilities/documents/Bat%20Interactions%20at%20Buffalo%20Ridge,%202003,%20EPRI.pdf>

Bat Interactions With Wind Turbines at the Buffalo Ridge, Minnesota Wind Resource Area

An Assessment of Bat Activity, Species Composition, and Collision Mortality

Technical Report



Appendix D. ALLETE Clean Energy Lake Benton Wildlife Reporting System Document and Form.



ALLETE Wildlife Impact Report Form

<u>ALLETE Wind Facility Name</u>			
<u>Entry Number</u>	<u>Date:</u>	<u>Time of Day</u>	<u>Injury/Fatality</u>
<u>Notification Given to</u>	<u>Date Notification Was Given</u>	<u>Structure #</u>	<u>Latitude/Longitude</u>
<u>Location Remarks:</u>			
<u>Species:</u>			
<u>Physical Condition:</u>	<u>Estimated Time Since Death:</u>	<u>Estimated Date of Injury:</u>	<u>Name of Respondent:</u>
<u>Other Notes:</u>			

ELM Follow up/Confirmation

<u>Date:</u>	<u>Perillon Entry Date:</u>	<u>Responding ELM staff:</u>
<u>Species Confirmation:</u>	<u>Threatened or Endangered:</u>	<u>Agencies contacted:</u>
<u>Action Items:</u>	<u>Carcass Preservation actions:</u>	<u>Other Notes:</u>

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Pictures and attachments

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Appendix E. Figures 5a & 5b Land Use/Cover Types found within the Project area.

