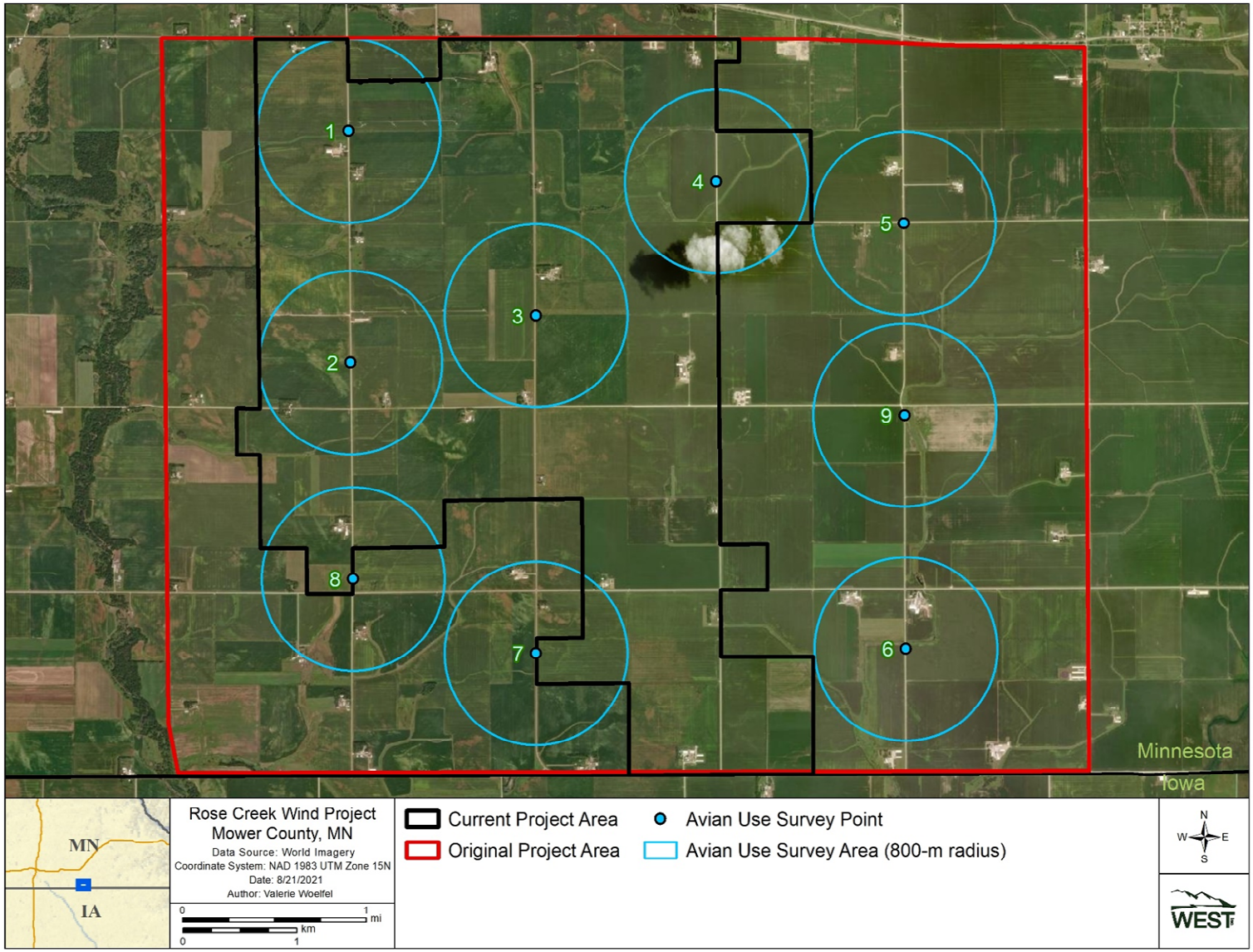

Figure 5. Avian use survey points for the Rose Creek Wind Project.

2.2.2 *Raptor Nest Surveys*

WEST conducted hybrid aerial and ground-based surveys to locate bald eagle and other raptor nests within 2.0 mi (3.2 km) of the original 12,745-acre Project area. Both surveys were conducted prior to leaf out; the ground-based survey was conducted on March 5, 2021, followed by the aerial survey component on March 12, 2021. The ground-based survey involved driving all public roads within the original Project area and a 2.0-mi buffer to observe adjacent potential nesting habitat. Ground-based surveys were supplemented with the aerial component in areas of potential high-quality raptor nesting habitat, including areas of dense forest and along river corridors within the 2.0-mi buffer, where habitat visibility from public roads was limited. Aerial surveys were conducted by helicopter and followed recommendations in Appendix C of the ECPG. The surveys were conducted by WEST biologists trained in aerial and ground-based nest survey methods.

Biologists collected standard raptor nest survey information, such as survey date, weather, observer name, the location (Global Positioning System and/or aerial imagery), and photographs of each potential nest observed, if possible. Biologists also recorded the following information for each potential nest site:

- Nest condition (poor, fair, good)
- Nest status (occupied active, occupied inactive, inactive)
- Nest substrate (e.g., deciduous tree, coniferous tree, man-made structure)
- Species (if occupied)

Six raptor nests representing three identifiable species were detected during the raptor nest surveys on March 5 and 12, 2021 (Figure 6). No raptor nests were documented within the original 12,745-acre Project area or the current 5,258-acre Project area. Three occupied and active bald eagle nests were documented within the survey area (nests 18117, 18119, and 1759). All three bald eagle nests are located more than 2.0 miles from the closest Project turbine; the closest nest (18117) is approximately 2.2 miles south of the turbine T4. Additional raptor nests documented during the surveys included one occupied and active great horned owl (*Bubo virginianus*) nest that was consistent in size and structure with a bald eagle nest (nest 18118), one occupied and active red-tailed hawk nest, and one occupied and inactive red-tailed hawk nest. For more information on the raptor nest survey methods and results, see WEST's *2021 Raptor Nest Survey* (WEST 2021b) report submitted to the MNDNR and MNDOC-EERA as a part of the LWECS site permit application.

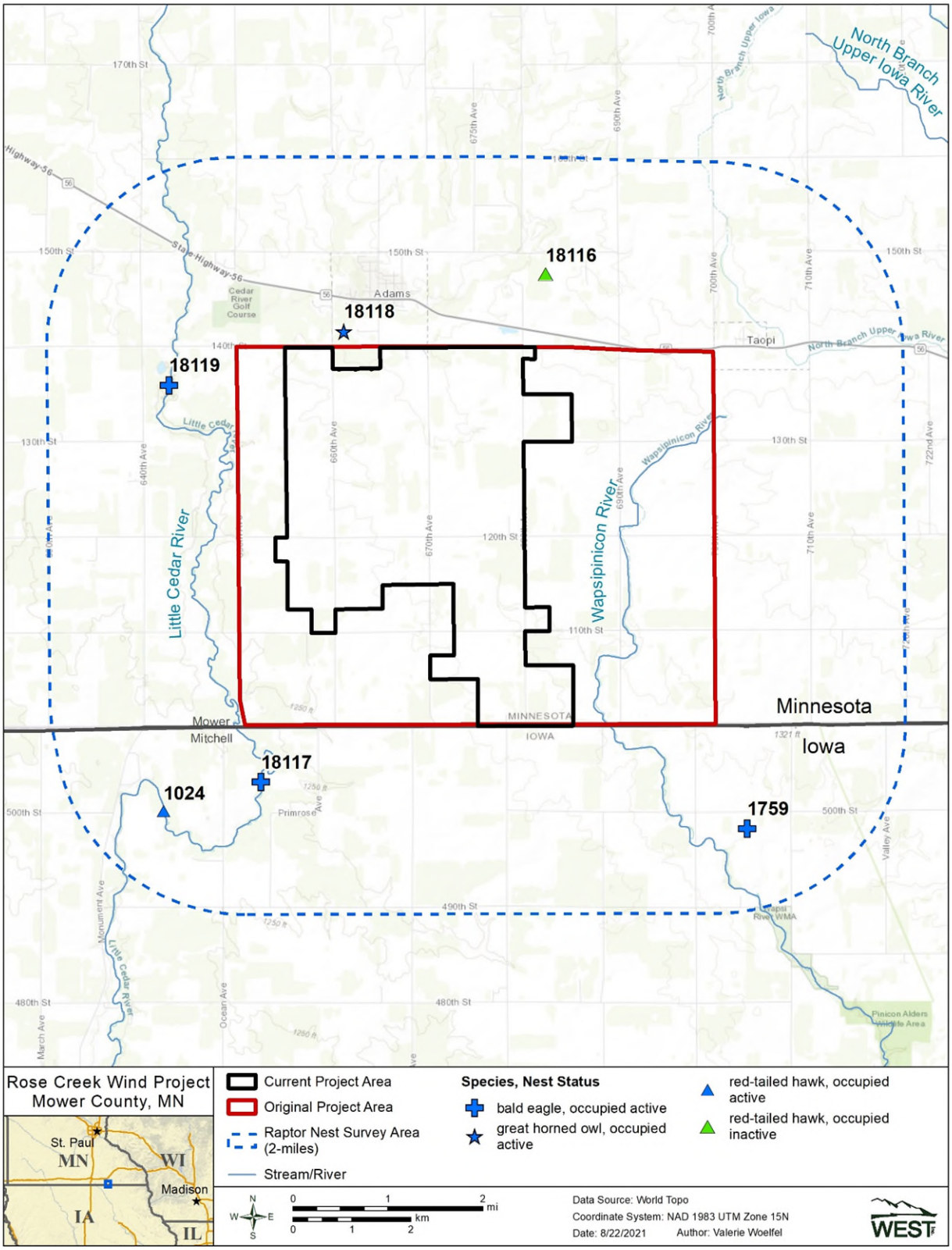

Figure 6. Raptor nest survey results for the Rose Creek Wind Project.

2.2.3 *General Bat Acoustic Surveys*

WEST completed one year of acoustic bat activity surveys for the Project to help better understand seasonal patterns in general bat activity levels. Seasonal bat activity was monitored using Song Meter SM3 full-spectrum ultrasonic bat detectors (Wildlife Acoustics, Concord, Massachusetts) at the Project between April 15 and October 20, 2021. During setup, the detectors were calibrated and sensitivity levels set according to manufacture recommendations in order to standardize the acoustic sampling effort across the Project area. Acoustic monitoring surveys estimated activity levels within the Project area for bats with high-frequency and low-frequency calls and attempted to correlate these activity levels with temporal trends within the Project area.

WEST selected two ground locations within the current and original Project area for acoustic surveys; detector locations are shown in Figure 7. One detector was positioned between crop fields in an agricultural area similar to the sites where turbines have been sited; this detector was intended to be representative of future turbine placement (representative station). A second detector was located north of the existing Rose Wind Project turbines in an area containing forest and water sources considered attractive to bats. This detector was intended to gather a more representative sampling of the bat species composition within the Project vicinity (bat feature station). The microphones deployed at the two chosen locations were elevated 1.5 m (4.9 ft) off the ground. Due to the lack of meteorological towers at the Project, no raised microphones set at or above the rotor-swept zone were included in the study design. Detectors were set to record daily from one half-hour prior to sunset until one half-hour after sunrise. MNDNR and MNDOC approved this survey methodology on February 25, 2021 and March 4, 2021, respectively.

Bat calls were recorded between April 16 and October 20, 2021. Per MNDNR request, WEST truncated the survey window to this active period for the bat activity analysis. Recorded bat activity was significantly higher at the bat feature station (98.35 ± 14.15 bat passes per detector-night) than the representative station (6.37 ± 0.73 bat passes per detector-night). Mean bat activity was higher in the summer (May 16 to July 31) at representative (8.90 ± 1.63) and bat feature stations (224.82 ± 30.24), followed by fall (August 1 to October 20; 6.04 ± 0.82 and 39.98 ± 3.62, respectively), and lowest in the spring (April 16 to May 15; 2.00 ± 0.48 and 24.29 ± 7.88, respectively). At the representative station, summer activity increased markedly starting in early July and peaked in late July. Bat activity remained elevated at the representative station until mid-September. The number of bat passes[2] per detector-night provides an index of bat activity; however, pass rate data do not represent individual bats and cannot be used to estimate population size. The number of bat passes was determined by experienced bat biologists using Analook software.

In addition, call files confirmed to have bat passes were further identified to the species level using the Bats of North America Classifier 5.4.0 in Kaleidoscope Pro Version 5.4.0 (Kaleidoscope; Wildlife Acoustics, Maynard, Massachusetts). Kaleidoscope identified bat calls for eight species

[2] A bat pass is defined as a sequence of echolocation calls produced by an individual bat and consists of a series of two or more calls (pulses) with no pause greater than one second between calls.

within the Project area. Hoary bats and silver-haired bats were the primary species recorded, present on 83% and 79% of all calendar nights, respectively, followed by big brown bats on 77% of calendar nights. Other species that Kaleidoscope commonly identified included little brown bat (73%), eastern red bat (53%), evening bat (39%), and tri-colored bat (30%). Little brown bats, tri-colored bats, and big brown bats are state-listed as Minnesota SPC.

Possible northern long-eared bat calls were identified by Kaleidoscope Pro on 9% of all calendar nights at the bat feature station. Two federally permitted bat biologists (Dr. Kevin Murray and Larisa Bishop-Boros, M.S.) manually reviewed all 21 calls initially classified as potential northern long-eared bat by qualitatively comparing echolocation call metrics (e.g., minimum frequency, slope, duration) to reference calls from the target bat species. None of the 21 calls initially classified as northern long-eared bats were confirmed via qualitative analysis. No other calls belonging to federally or state-listed bat species were identified by Kaleidoscope or verified by WEST acoustic analysts.

A report describing the results of acoustic bat surveys at the Project will be submitted to the MNDNR and MNDOC-EERA in early 2022.

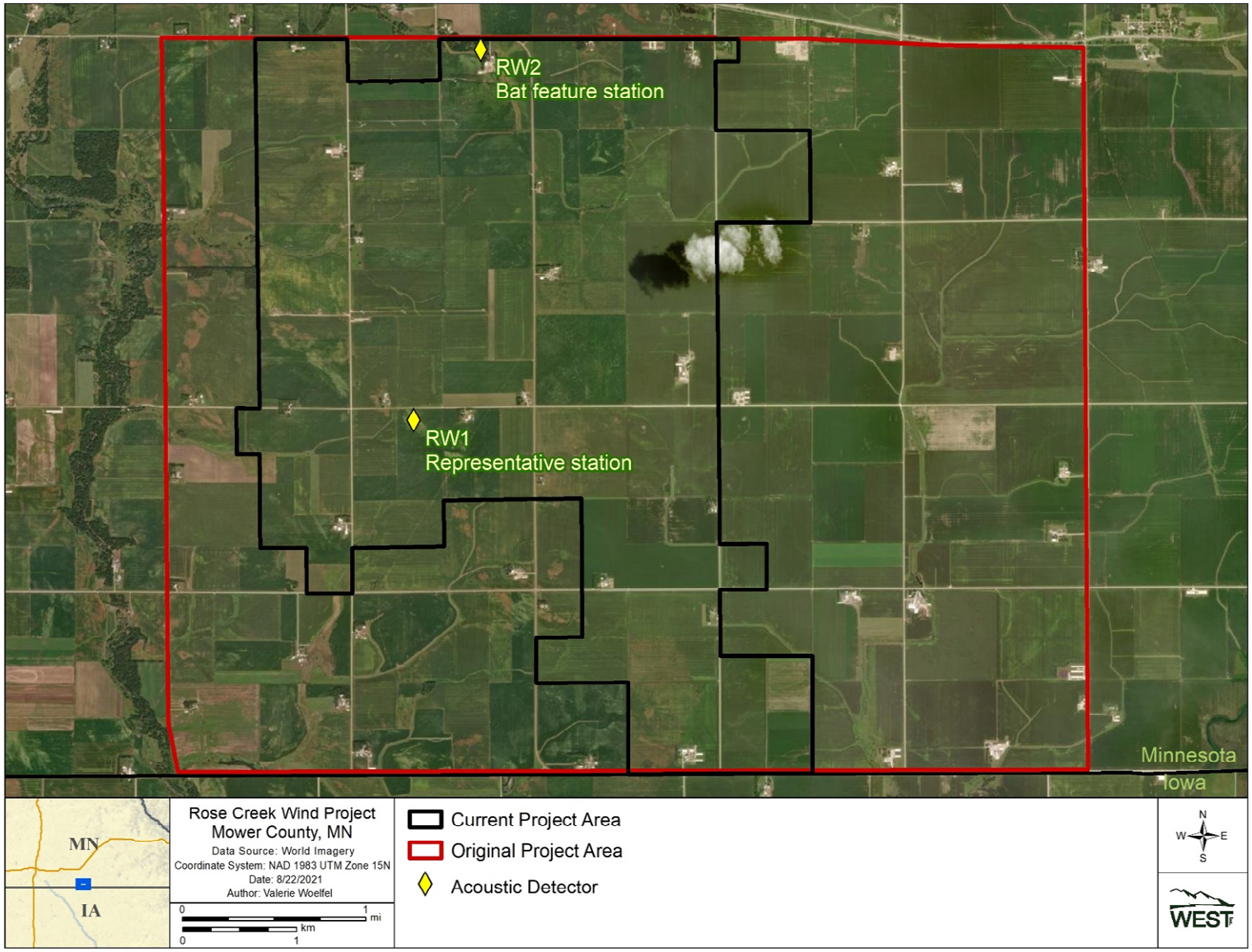

Figure 7. General bat acoustic survey locations for the Rose Creek Wind Project.

2.2.4 *Northern Long-eared Bat Habitat Assessment*

CED requested WEST complete a NLEB habitat assessment to identify and quantify potentially suitable summer NLEB habitat within and near the original 12,745-acre Project area. This assessment follows the NLEB guidance provided in the *2020 Range-Wide Indiana Bat Summer Survey Guidelines* (USFWS 2020a).

Suitable habitat was evaluated within an assessment area that included the original Project area and a 2.5-mi buffer around the original Project area. This buffer ensured that all suitable habitat that could affect NLEB use within and around the original Project area would be identified.

Forested areas within the assessment area were visually assessed and digitized to achieve high classification precision and accuracy. An experienced bat biologist reviewed the resulting forested patches for biological relevance. Using professional opinion, the bat biologist evaluated the suitability of each patch digitized to ensure all final patches deemed suitable were valid and to ensure no patches were excluded that could be ecologically important.

The resulting forest patches were grouped into three categories by size and suitability. Contiguous forests and/or riparian corridors 10 ac (four ha) or larger provide habitat for NLEB roosting, foraging, and commuting, and were considered suitable summer habitat. Since NLEB also utilize open areas adjacent to suitable forest habitat, a 1,000-ft buffer was applied to forest patches 10 ac or larger. All forested areas within or intersecting this buffer, regardless of patch size or canopy closure, were considered potentially suitable habitat for NLEB and included in the suitable NLEB habitat acreage. Individual trees and small isolated forest stands (less than 10 acres in size) located outside the 1,000-ft buffer were considered unsuitable habitat for NLEB, per supporting research (Foster and Kurta 1999, Henderson and Broders 2008, USFWS 2015). Trees in highly developed urban areas and sapling patches or wooded areas containing only trees under three inches (eight centimeters) in diameter at breast height were also considered unsuitable habitat.

Within the assessment area, 2,125 ac (860 ha) of suitable NLEB summer habitat are primarily situated within the riparian areas of the Little Cedar River, Wapsipinicon River, Iowa River, and their tributaries (Figure 8). A total of 30.4 ac (12.3 ha) of suitable NLEB habitat was located within the original Project area, with the largest suitable habitat areas intersecting the Project's western edge along the Little Cedar River and additional smaller suitable habitat areas located near the Project boundary in the southeast and northwest. However, due to the Project boundary revisions, only 2.0 acres (0.8 ha) of potentially suitable NLEB summer habitat remain within the current Project area; this acreage includes two small riparian patches located east of the Little Cedar River on the western and northwestern edges of the current Project area.

The identified suitable summer habitat areas and 1,000-ft potential NLEB use areas were used to evaluate and site Project turbines and associated facilities, and to assist with Project environmental reviews and permitting. For more information on NLEB habitats, see WEST's *Rose Creek Wind Project Northern Long-eared Bat Habitat Assessment* (WEST 2021a) submitted to the MNDNR and MNDOC-EERA as a part of the LWECS site permit application.

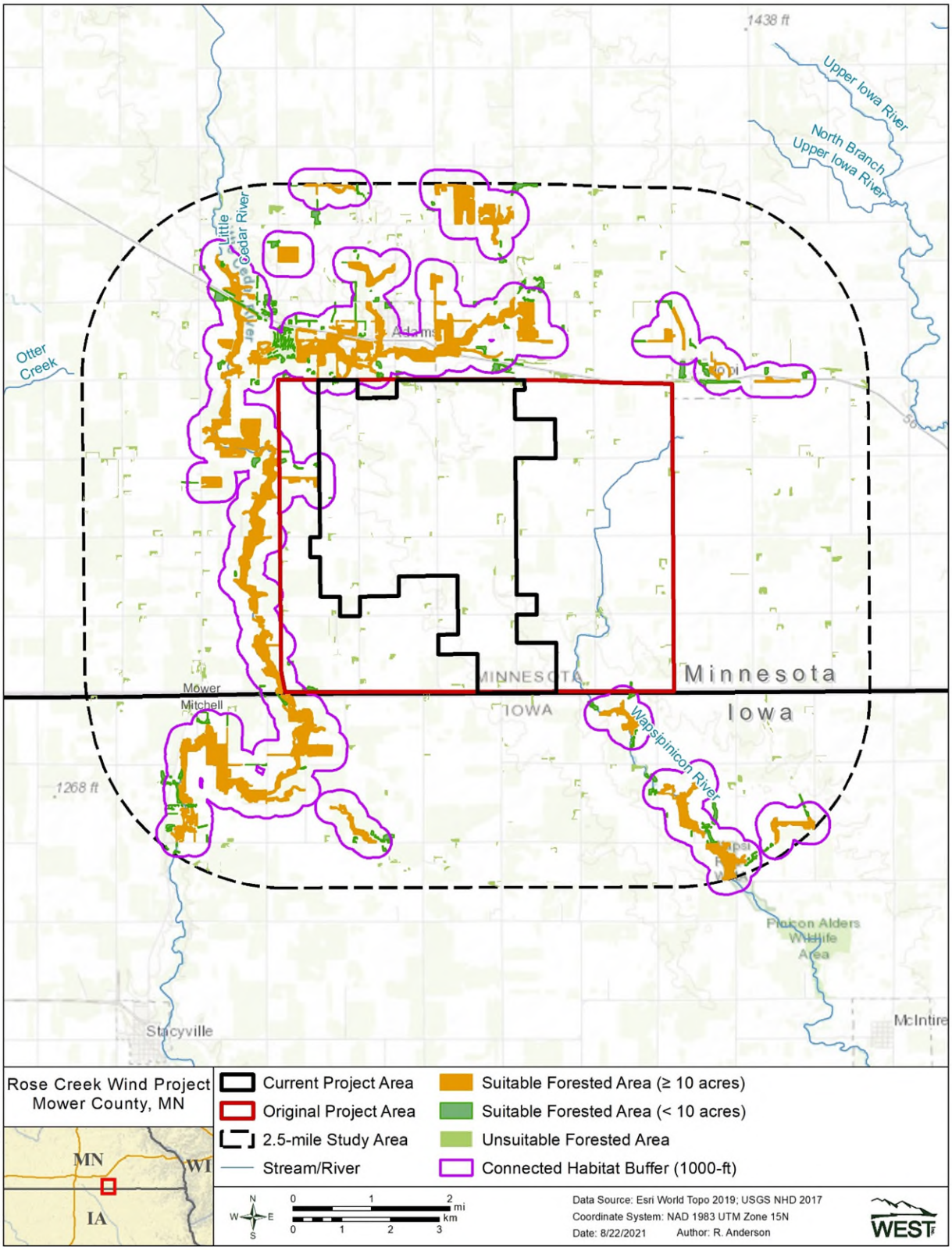

Figure 8. Potentially suitable summer habitat for northern long-eared bats within and near the Rose Creek Wind Project.

3.0 RISK ASSESSMENT - POTENTIAL IMPACTS TO RARE AND PROTECTED SPECIES

Tier 3 of the WEG recommends that wind facility operators evaluate the potential direct and indirect impacts from a project on birds and bats. The analysis presented below addresses the impacts associated with Project siting and turbine placement, construction, operations and maintenance, and decommissioning.

3.1 Indirect Impacts

Indirect impacts can occur because of habitat loss and fragmentation due to the development and operation of wind energy facilities. Facility development generally includes not only turbines, but also associated infrastructure (e.g. access roads) that encompasses a larger footprint than the small, isolated turbine pads, and contributes to potential habitat impacts. Habitat loss may also include habitat alternations, such as increased edge exposure, that can cause behavioral avoidance of previously suitable habitat areas in some species, and may increase predation (mortality) rates or reduce feeding or breeding success in others.

Rose Creek sited the Project to minimize indirect impacts to wildlife species, including birds and bats, by placing turbines and other Project infrastructure primarily within previously disturbed agricultural areas; avoiding wetlands, waterbodies, and naturally vegetated areas, including forests and potential prairies; and using developed road systems to the extent possible. Post-construction restoration will occur in temporarily disturbed areas, reducing the length of time until affected wildlife habitats are revegetated.

Sound and increased vehicle traffic generated during construction, operation, and decommissioning can alter species feeding and breeding behaviors, and may cause wildlife to avoid the Project area. Temporary increases in intermittent sound, traffic, and human activity will be primarily limited to the duration of construction (typically three to six months) and site decommissioning (typically three months), and are not expected to cause permanent site avoidance by wildlife species. Background turbine noise and movement during Project operations are not expected to differ significantly from the existing Rose Wind Project conditions.

As stated in Section 4 below, conservation measures and industry best management practices (BMPs) will be implemented during Project construction, operation, and decommissioning to avoid and minimize the extent of vegetation removal and indirect impacts to wetlands and waterbodies. Information gathered during Tier 1 and 2 assessments, as well as ongoing biological surveys, was used in the infrastructure siting and design processes to minimize potential impacts to birds and bats and potential habitats. The Project will follow a decommissioning plan for the repowered turbines at the end of the Project's operational life, to minimize impacts from decommissioning.

3.1.1 *Birds*

Indirect impacts to raptors, including eagles, are not well understood, but likely depend on multiple factors that differ between raptor species (Watson et al. 2018). The presence of wind turbines

may result in the loss or fragmentation of raptor habitat (Watson et al. 2018) and may lead to the abandonment of raptor nesting territories (Dahl et al. 2012) or reduce nest success and post-fledging survival (Kolar and Bechard 2016). Indirect impacts to eagles and other raptors are expected to be minimal, due to the conservation measures detailed in Section 4.

Most of the Project area overlaps agricultural land, including both cultivated crop and hay/pasture land cover types (Table 1). Generally, these areas are considered less sensitive to disturbance because they have been previously disturbed and usually do not harbor of native plants or habitats. However, these areas can provide important stopover sites for migrating waterfowl, particularly within the Mississippi Flyway. Some studies have suggested that operating turbines may lead to reduced abundance of waterfowl (Osborn et al. 1998, Johnson et al. 2000), whereas other studies have found the presence of operating turbines to have no effect (USFWS 2009). During migration, birds typically fly at higher altitudes (Ehlrich et al. 1988, Butler 2016) and in theory may be at lower risk for collision with turbines. Population-level impacts for these species are not expected to occur as a result of Project operation.

This region of southeastern Minnesota and northeastern Iowa contains many existing wind projects. The existing 11-turbine Rose Wind Project composes less than 3% of the turbines within a 10-mi-radius of the current Project boundary; thus the repowering turbines for the Project is not expected to contribute an appreciable effect on bird migration or stopover habitat use.

Habitat loss, either quantity or quality, is the primary indirect effect expected for passerines at a wind facility. Most of the land cover in the current Project area has already been converted to agricultural uses with 0.5% remaining in grassland cover (hay/pasture and herbaceous land cover classes; Table 1). Some grassland dependent species are sensitive to changes in their habitats and less likely to use areas near operating wind turbines (Leddy 1996, Johnson et al. 2000b, Young et al. 2006, Shaffer and Johnson 2009, Shaffer and Buhl 2015). Because grassland habitat is limited in the current Project area, significant indirect impacts to grassland bird species and other passerines are not expected.

3.1.2 *Bats*

Impacts to bats at wind energy facilities are mostly caused by direct mortality, but indirect impacts such as habitat loss may occur. Any clearing of trees or old buildings may have indirect impacts on any bats that use these habitats for roosting or hibernation. Bat roosting and forested habitat is minimal within the current Project area (2.0 ac; Sections 2.1.2.2 and 2.2.4), and all turbines have been sited more than 1,000 ft from suitable summer NLEB roosting and foraging habitat to reduce potential Project impacts.

3.1.3 *Plants and Aquatic Species*

The Project was designed to avoid impacts to undisturbed grasslands and prairie habitat types by placing turbines in cultivated crop fields; therefore, impacts to listed plant species are not anticipated.

Rose Creek will not construct turbines, access roads, or other above ground structures within or within close proximity to streams. Furthermore, if any new collector systems are installed across tributaries to the Little Cedar River, trenchless installation techniques will be used; therefore, impacts to listed aquatic species are not anticipated. The eventual decommissioning of the Project turbines and associated infrastructure will also take place primarily within crop fields and will avoid future impacts to streams and native vegetation.

3.2 Direct Impacts

The current Project design does not include any overhead power lines, guyed meteorological towers, or an O&M building, and Rose Creek sited Project infrastructure to avoid potentially sensitive habitats and natural areas. Additionally, as stated in Section 4 below, conservation measures and BMPs will be implemented to avoid direct impacts during all aspects of the Project construction process, including initial planning, design, and decommissioning. Consequently, the primary potential for direct impacts to birds and bats are associated with blade strike mortality during Project operations.

The USFWS and other wildlife agencies generally recommend that the siting of wind projects and placement of turbines is one of the major methods to minimize potential long-term direct impacts to wildlife. As part of the repower, turbines were sited over two mi from all known eagle nests and over 1,000 ft from potential NLEB bat summer roosting habitat. Additionally, all turbines were sited in cultivated fields, where bird and bat activity is expected to be minimal. These avoidance measures and micro-siting of the repower turbines will minimize long-term direct impacts to birds and bats from turbine collision.

As a part of the repower, the number of Project turbines will be reduced from 11 to six or seven turbines. Though the overall nameplate capacity of the Project will remain at up to 17.4 MW, the proposed turbines will be larger both in size and in MW, and are collectively expected to produce more electricity than the existing Rose Wind Project turbines[3]. While it has been hypothesized that larger turbine size and wider turbine spacing may decrease risk to birds and bats, analyses from hundreds of publicly available studies have not shown a strong correlation between bird or bat fatality rates and turbine size (WEST 2019, Newman et al. 2020). A recent study conducted by the USGS found that the relative amount of energy produced (i.e., MW hours) may be a better predictor of bird and bat fatality rates (Huso et al. 2021). Bird and bat fatality rates at the Project may increase due to the higher cumulative energy output; however, this increase is expected to be negligible due to the small size of the Project and reduced number of turbines.

3.2.1 *Bird and Bat Fatality Rates*

PCM surveys were not conducted for the existing Rose Wind Project; however, WEST reviewed recent publicly available studies at recently constructed (2011 – 2017) wind energy facilities in the Eastern Iowa and Minnesota Drift Plains Level IV Ecoregion to assess potential direct impacts

[3] The existing Rose Wind Project turbines are outdated and currently operating under the 17.4 MW nameplate capacity. The proposed Project turbines are newer and more efficient, and are thus expected to outperform the existing Rose Wind Project turbines' energy output, while remaining at or below the same nameplate capacity.

at the Project. Estimated fatality rates at other projects in the ecoregion ranged from 0.51 to 8.44 bird fatalities per MW per study period and 1.8 to 12.55 bats fatalities per MW per study period (Tables 4 and 5). Among these wind energy facilities, Pleasant Valley, located approximately 9.4 mi north of the Project, is the closest facility with available bird fatality rates; the Pioneer Prairie II Wind Project, located 0.4 mi south of the Project, is the closest facility with available bat fatality rates. Both of these projects lie within an agricultural landscape similar to the Project. The estimated bird fatality rate at Pleasant Valley during 2016 – 2017 was 0.68 birds per MW (Tetra Tech 2017). The estimated bat fatality rate at Pioneer Prairie II was 10.06 bats per MW during 2011 – 2012, and was 9.83 bats per MW during 2013 (WEST 2019).

The current Project area is dominated by agriculture and all turbines will be placed in cultivated fields. Base on the low availability of natural habitats in the current Project area and given the similarities between the agricultural landscapes in the Project and nearby wind energy facilities, post-construction bird and bat fatality rates at the Project are expected to fall within the overall range of those seen at other wind energy facilities in the region.

Table 4. Bird fatality rates at recently constructed wind energy facilities in the Eastern Iowa and Minnesota Drift Plains Level IV Ecoregion.[1]

Project	Estimated Fatalities/MW/Study Period (90% Confidence Interval) [1,2]
Oak Glen, MN (2013)	0.51 (0.22–1.01)
Pleasant Valley, MN (2016 – 2017)	0.68 (0.53–0.90)
Vienna II, IA (2015 – 2016)	3.57 (1.45–7.13)
Charles City, IA (2015 – 2016)	4.13 (2.43–6.54)
Vienna I, IA (2015 – 2016)	5.70 (3.76–8.72)
Wellsburg, IA (2015 – 2016)	8.44 (5.18–13.94)

Source: Charles City (Bay et al. 2017a), Oak Glen (Chodacheck et al. 2014a), Pleasant Valley (Tetra Tech 2017),Vienna I (Bay et al. 2017a), Vienna II (Bay et al. 2017a), Wellsburg (Bay et al. 2017a).

[1] Compiled from similar, recently constructed projects (2011 – 2017) with publicly available data.
[2] Confidence intervals are shown when provided in study report

MW= megawatt

Table 5. Bat fatality rates at recently constructed wind energy facilities in the Eastern Iowa and Minnesota Drift Plains Level IV Ecoregion.[1]

Project	Estimated Fatalities/MW/Study Period (90% Confidence Interval) [1,2]
Pleasant Valley, MN (2016 – 2017)	1.80 (1.38–2.39)
Oak Glen, MN (2013)	3.09 (1.99–5.34)
Grand Meadow, MN (2013)	3.11 (1.82–5.36)
Vienna I, IA (2015 – 2016)	9.27
Pioneer Prairie II, IA (2013)	9.83 (7.56–13.34)
Pioneer Prairie II, IA (2011 – 2012)	10.06 (6.70–16.32)
Vienna II, IA (2015 – 2016)	10.48
Wellsburg, IA (2015 – 2016)	12.55

Source: Grand Meadow (Chodacheck et al. 2014a), Oak Glen (Chodacheck et al. 2014a), Pleasant Valley (Tetra Tech 2017), Pioneer Prairie II (Chodacheck et al. 2012, 2014b; MidAmerican Energy Company 2018), Vienna I (Bay et al. 2017b), Vienna II (Bay et al. 2017b), Wellsburg (Bay et al. 2017b).

[1] Compiled from similar, recently constructed projects (2011 – 2017) with publicly available data.
[2] Confidence intervals are shown when provided in study report

MW= megawatt

3.2.2 *Seasonal Turbine Risk*

The greatest mortality risks associated with operation of the Project turbines are anticipated to occur during the spring and fall migratory periods for birds (Figure 9a) and the fall migratory period for bats (Figure 9b). Risks are anticipated to be lower during the summer breeding season and at a minimum during the winter, when passage rates and abundances of birds and bats are at seasonal lows.

Due to the age of the existing Rose Wind Project turbines, no seasonal curtailment or feathering has been applied during turbine operation to date. To minimize Project bat fatalities, the Project has committed to feathering turbine blades up to manufacturer's cut-in speed from one-half hour before sunset to one-half hour after sunrise during the fall migration season from mid-July to mid-October, in accordance with voluntary guidance from the American Wind Energy Association and peak seasonal activity patterns observed at Minnesota wind projects (Figure 9b). This conservation measure would be expected to reduce bat collisions for the repowered turbines, potentially reducing fatalities below the existing Rose Wind Project rates.

On January 14, 2016, the USFWS published a 4(d) rule for the NLEB (USFWS 2016). Under the 4(d) rule, incidental take of NLEBs due to operation of a wind farm is not prohibited. However, construction impacts to potentially suitable habitat remain a concern, and the NLEB 4(d) rule prohibits incidental take resulting from tree clearing within 150 feet of a known occupied maternity roost tree during the pup season (June 1 to July 31). To avoid unanticipated disturbances to NLEB during Project construction, Rose Creek has committed to avoiding tree felling during the pup season (June 1 to July 31).

In addition, Rose Creek has committed to avoiding tree felling between April 1 and September 10, as recommended by the USFWS, to reduce potential construction impacts to migratory birds (USFWS 2008). This conservation measure will also avoid unanticipated disturbances to tree-roosting bats during the majority of their active season (see Section 4.3).

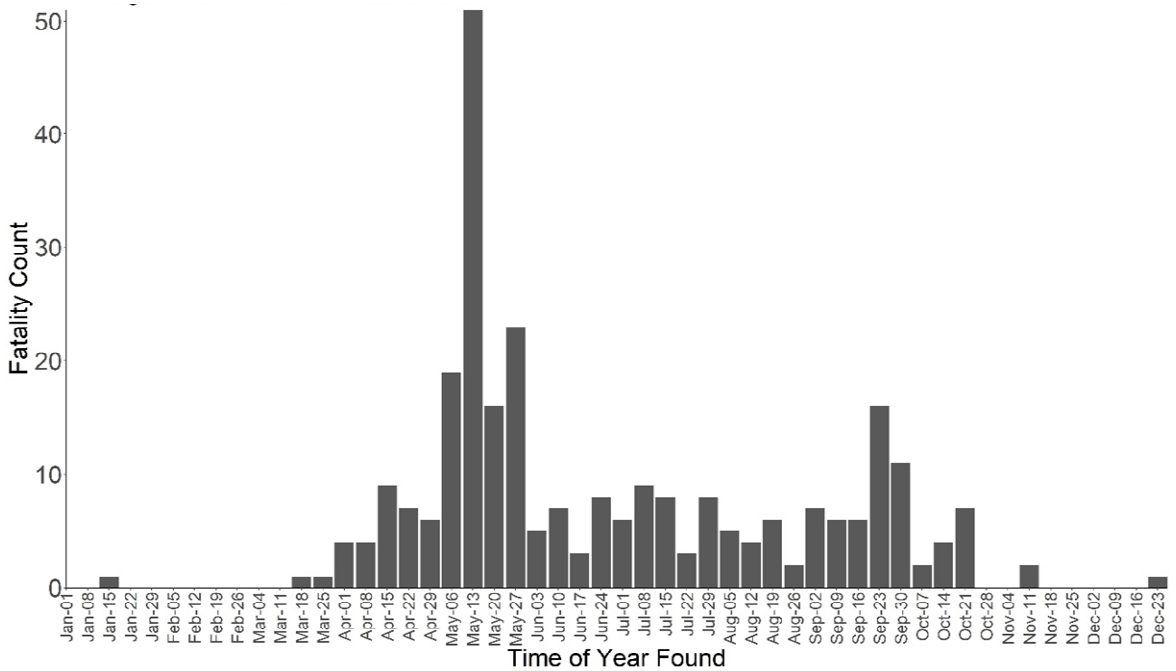

Figure 9a. Timing of bird fatalities at wind energy facilities in Minnesota (based on publically available data [WEST 2019]).

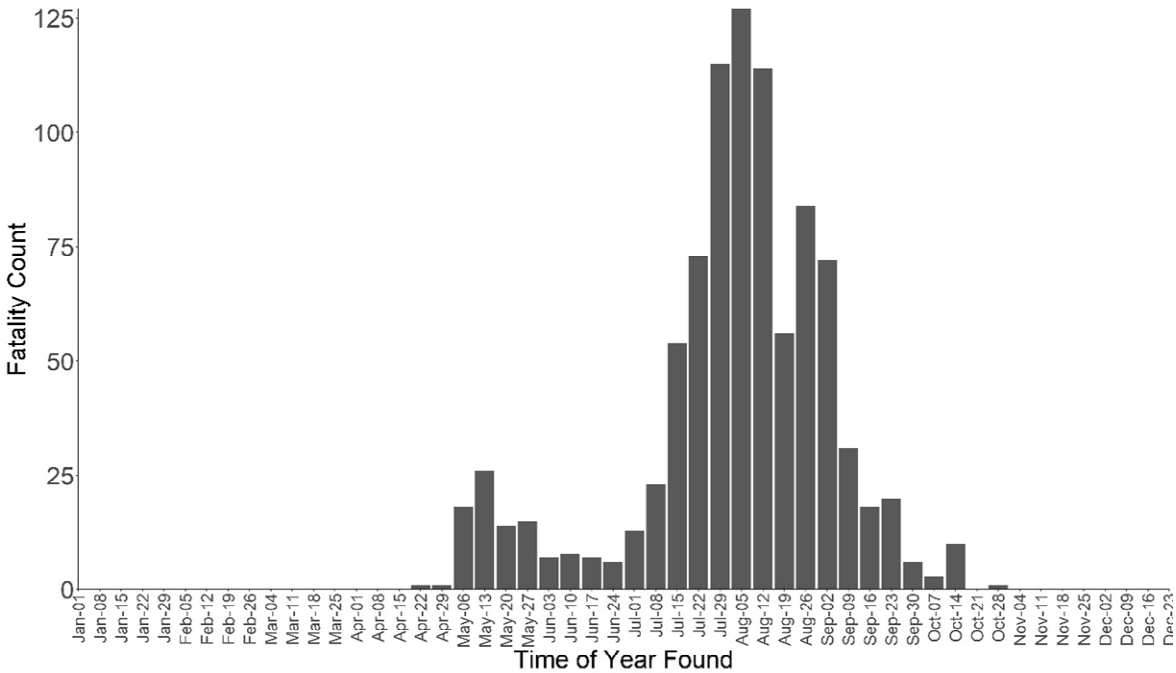

Figure 9b. Timing of bat fatalities at wind energy facilities in Minnesota (based on publically available data [WEST 2019]).

3.2.3 *Sensitive Species Found as Fatalities*

Fatality counts and species lists were publicly available for PCM studies at Pleasant Valley (Tetra Tech 2017), Vienna I (Bay et al. 2017a, 2017b), Vienna II (Bay et al. 2017a, 2017b), Pioneer Prairie II (Chodacheck et al. 2012, 2014b; MidAmerican Energy Company 2018), Wellsburg (Bay et al. 2017a, 2017b), and Charles City (Bay et al. 2017a, 2017b). PCM studies at these facilities resulted in the discovery of 831 bird and bat fatalities, including 104 (12.5%) state-listed SPC (four birds, 100 bats; Table 6); no state-listed threatened or endangered or federally listed species were documented in these studies. Of the documented SPC fatalities, big brown bats and little brown bats appear to be the most susceptible to wind turbine collisions in this region.

Table 6. Sensitive species found as fatalities at recently constructed wind energy facilities in the Eastern Iowa and Minnesota Drift Plains Level IV Ecoregion.[1]

Project	Sensitive Species Found As Fatalities
Charles City, IA (2015 – 2016)	7 big brown bats, 13 little brown bats
Pioneer Prairie II, IA (2013)	6 little brown bats
Pioneer Prairie II, IA (2011 – 2012)	2 big brown bats, 13 little brown bats
Pleasant Valley, MN (2016 – 2017)	3 big brown bats, 14 little brown bats
Vienna I, IA (2015 – 2016)	7 big brown bats, 3 little brown bats, 1 tri-colored bat 2 short-eared owls, 1 purple martin
Vienna II, IA (2015 – 2016)	2 big brown bats, 2 little brown bats, 1 tri-colored bat
Wellsburg, IA (2015 – 2016)	18 big brown bats, 7 little brown bats, 1 tri-colored bat 1 purple martin
Total	**39 big brown bats, 58 little brown bats, 3 tri-colored bats 2 short-eared owls, 2 purple martins**

Sources: Charles City (Bay et al. 2017b), Pioneer Prairie II (Chodacheck et al. 2012, 2014b; MidAmerican Energy Company 2018), Pleasant Valley (Tetra Tech 2017), Vienna I (Bay et al. 2017a, 2017b), Vienna II (Bay et al. 2017b) and Wellsburg (Bay et al. 2017a, 2017b).

[1] Compiled from similar, recently constructed projects (2011 – 2017) with publicly available data.

Studies of bald eagle use, flight paths, and nesting before and after construction of wind facilities suggest that bald eagles may detect and avoid operating wind turbines to a degree (Garvin et al. 2010, Ferrer et al. 2011), actively minimizing their use near operating wind energy facilities. Project avian use surveys are ongoing, but to date have recorded relatively low eagles use at the site. Based on this relatively low eagle use, placement of turbines more than two mi from active nests, and the lack of incidental bald eagle fatalities at the existing Rose Wind and Adams Projects, the current Project area does not contain areas of high eagle use or resources that would suggest a high risk to eagles during operation.

4.0 CONSERVATION MEASURES AND BEST MANAGEMENT PRACTICES TO AVOID AND MINIMIZE ADVERSE IMPACTS

Rose Creek will incorporate the avoidance and minimization measures listed below during the siting, design, construction, operation, and decommissioning of the Project. These measures are based on the USFWS WEG and ECPG, LWECS site permit application guidance, and industry BMPs, and are intended to provide a practical means to reduce potential impacts to birds, bats, and potential habitats.

Rose Creek will comply with all applicable local, state, and federal environmental laws and regulations. Employees and contractors will be informed of all applicable permit conditions, including those intended to avoid and minimize impacts to wildlife and wildlife habitats during decommissioning, construction, and reclamation activities.

In addition to birds and bats, Rose Creek has also closely evaluated and implemented measures to avoid impacts to other sensitive biological and natural resources in consultation with the appropriate agencies, including identifying and avoiding impacts to potential native prairies and the federally and state-listed species that may utilize them as suitable habitat. For additional information related to undisturbed grasslands and potential native prairies in the Project area, see the Native Prairie Desktop Assessment report submitted to the MNDNR and MNDOC-EERA as a part of the LWECS site permit application.

4.1 Project Siting Measures

- The Project was designed with standard setbacks for non-participating landowners, residences, state- and federally owned lands (i.e., a five RD buffer in the prevailing wind direction and a three RD buffer in the non-prevailing wind direction), and for factors such as sound and shadow.
- All turbines were sited in cultivated fields to avoid or minimize impacts on natural areas, such as grasslands and wetlands, and reduce potential impacts to wildlife and habitats.
- All turbines were sited at least 2.0 mi from occupied active bald eagle nests identified during Project surveys.
- Turbines were sited more than 1,000 ft from potentially suitable summer NLEB habitat to minimize impacts to the federally threatened NLEB and bats in general.
- Other Project infrastructure (e.g., collector lines, access roads) were sited to avoid or minimize impacts to non-agricultural vegetation to the extent practicable. When possible, existing roads and field access points will be used or improved for use as Project access roads to avoid clearing natural habitats during construction.
- The upgraded Project substation will be slightly larger than the existing substation; however, the current substation footprint will be utilized to reduce the extent of disturbance during construction. The expanded substation footprint will be designed to avoid impacts to nearby wetlands and waterbodies near the Project.

- Where possible, Project infrastructure has been sited to avoid impacts to undisturbed grasslands that may contain potential native prairie, as described in the Native Prairie Desktop Assessment (LWECS site permit application, Appendix K).

4.2 Project Design Measures

- The Project was designed with fewer overall turbines than the existing Rose Wind Project (reduced from 11 turbines to six or seven proposed turbines).
- The proposed turbines will be larger (both in physical size and in per-turbine MW) than the existing turbines, though the overall nameplate capacity of the Project will remain at up to 17.4 MW. As mentioned above, direct impacts to birds and bats may increase due to the repower Project's higher cumulative energy output; however, this increase is expected to be negligible due to the small size of the Project and reduced number of turbines.
- Wind turbines were designed with tubular towers and with no external ladders or platforms on the towers or nacelles to minimize bird perching and nesting opportunities.
- The visibility lighting associated with turbines will be minimized, within Federal Aviation Administration (FAA) requirements (FAA 2020).
- Traditional obstruction lighting for turbines continuously flashes on a set interval. Rose Creek will use FAA-approved lighting with the shortest allowable flash duration, the minimum allowed flashes per minute, and ensure that all lights flash at the same time so that nocturnal migrating birds are not disoriented by lights.
- No meteorological towers are proposed for the Project.
- Electrical collection systems within the Project area will be buried underground. The Project also plans to utilize existing aboveground electrical lines associated with the Project substation tie-in.

4.3 Construction Measures

- All construction personnel working on the Project site will be trained to identify sensitive biological resources and respond appropriately to minimize potential impacts to those resources. Training will focus on the avoidance and minimization measures to be implemented during construction, as described in this BBCS.
- Industry-standard BMPs will be utilized to minimize surface erosion and protect topsoil and adjacent resources. These practices may include silt fencing, temporary reseeding, permanent seeding, mulching, filter strips, erosion blankets, grassed waterways, and sod stabilization, depending on site-specific needs.
- Standard construction BMPs will be implemented to minimize potential for accidental spills, contamination, debris, and pollution. Excavated material and other construction materials will not be stockpiled or deposited on or near stream banks.

- All employees and contractors will follow federal and state regulations for the handling and storage of hazardous materials to minimize contamination of water, soil, and other wildlife resources. A Spill Prevention, Control, and Countermeasure Plan will be developed to outline spill response/containment and clean-up procedures.
- No burning or burying of waste materials will occur at the Project. All contaminated soil and construction debris will be removed and disposed of in accordance with appropriate environmental regulations.
- Vehicle speed limits of 25 mi (40 km) per hour will be implemented on all Project access roads to minimize wildlife mortality due to vehicle collisions.
- Travel will be restricted to designated roads; off-road travel will be minimized to the extent feasible.
- Cranes used in turbine construction will be broken down between each turbine and transported via Project access roads; therefore, temporary impacts from crane paths are not anticipated.
- Where underground feeder or collector lines cross waterbodies, Rose Creek will directionally bore to avoid impacts to waterways and the adjacent riparian areas.
- Removal or disturbance of vegetation during construction will be minimized through site management (e.g., by utilizing previously disturbed areas, designating equipment/ materials storage yards and staging areas), wherever possible.
- Rose Creek will restore temporarily disturbed, non-cultivated workspace areas after construction to reduce the length of time until affected wildlife habitats are revegetated. Rose Creek's Storm Water Pollution Prevention Plan (SWPPP) will specify appropriate weed-free seed mixes for restoration.
- Following the installation of turbines, temporary access roads will be removed and the area will be restored to pre-construction conditions.
- If tree removal is unavoidable, tree removal will be conducted in accordance with the NLEB 4(d) rule and will occur outside of the NLEB pup season (June 1 to July 31).
- Rose Creek will avoid tree felling between April 1 and September 10 to reduce potential construction impacts to migratory birds and to avoid unanticipated disturbances to tree-roosting bats during the majority of their active season.
- If unavoidable temporary impacts to desktop-derived potential prairies or probable degraded grasslands (as defined in the Native Prairie Desktop Assessment) occur from Project construction, Rose Creek will restore these areas to pre-construction conditions using a seed mix consistent with state requirements.

- If Project layout changes would alter the proposed impacts to desktop-derived potential prairies or probable degraded grasslands, Rose Creek will coordinate with the MNDNR and MNDOC-EERA. If deemed necessary based on agency coordination, a Native Prairie Protection Plan will be developed prior to Project construction. The Native Prairie Protection Plan would document the steps taken to avoid and minimize impacts to potential prairies and degraded grasslands during Project design, and describe any conservation measures that would be implemented to reduce adverse effects to these areas during Project construction, restoration, and operation.

4.4 Operational Measures

- All employees and contractors working on the site will be trained to identify sensitive biological resources, including bird and bat species, and respond appropriately to minimize potential impacts to those resources. Training will focus on site-specific biological resources, restrictions, protection measures, and responsibilities intended to minimize wildlife impacts throughout the operational life of the Project.
- Rose Creek will hire a third party to conduct at least one year of standardized PCM surveys to evaluate bird and bat fatalities during Project operations. The PCM survey approach will address Tier 4 of the WEG (USFWS 2012) and adhere to the guidance provided in the MNDNR and MNDOC-EERA's *Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems in Minnesota* (Mixon et al. 2014).
- The Project will implement an Adaptive Management Program (see Section 6) for avoidance, minimization, and mitigation of impacts to birds, bats, and other sensitive wildlife.
- 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 potential habitat.
- Vehicle speed limits of 25 mi per hour will be implemented on all Project access roads to reduce potential for wildlife collisions.
- Best management practices for fire prevention will be implemented to minimize potential for wildfires.
- During normal operational activities, if facility personnel discover road-killed animals or other carcasses (excluding eagles and other migratory birds) on or near Project facilities, reasonable measures will be taken to promptly remove this carrion to avoid attracting eagles or other scavengers (e.g., raptors) to the Project area. Carcass removal will be conducted following an approved protocol.
- A Wildlife Incident Reporting System will be implemented to establish protocols for identifying, tracking, and reporting bird and bat fatalities, per LWECS site permit requirements.

- To minimize Project bat fatalities, turbine blades will be feathered up to manufacturer's cut-in speed from one-half hour before sunset to one-half hour after sunrise between mid-July and mid-October, in accordance with American Wind Energy Association guidance and peak seasonal activity patterns observed at Minnesota wind projects.

4.5 Decommissioning Measures

- Rose Creek has developed and will adhere to a decommissioning plan to ensure construction BMPs and applicable potential wildlife habitat avoidance and minimization measures are followed at the end of the Project's operational life.

5.0 POST-CONSTRUCTION MONITORING (TIER 4)

According to the WEG, PCM surveys analyze the direct effects of a project's operation and assess whether actions taken earlier in the development process to avoid and minimize potential operational impacts to birds and bats were successful. PCM surveys generally provide bird and bat fatality rates for a project that can then be compared to fatality rates from other facilities in the region. The results of PCM surveys can determine whether additional steps may be necessary to compensate for high-than-expected impacts to birds and bats (USFWS 2012).

5.1 Formal Post-Construction Fatality Monitoring

Rose Creek will conduct at least one year of standardized PCM surveys following construction of the repowered Project to provide information on the overall direct impact of the Project on birds and bats. A study plan with detailed survey plans will be developed in coordination with the MNDNR and MNDOC-EERA after the LWECS site permitting process is complete and prior to the start of operation. The PCM survey approach will address Tier 4 of the WEG and adhere to the guidance provided in the MNDNR and MNDOC-EERA's *Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems in Minnesota* (Mixon et al. 2014). Survey results will be provided to the USFWS, MNDOC-EERA, and MNDNR no later than March 15 of the year following the surveys.

As discussed in Section 3.2.1, impacts to bird and bat species are anticipated to be within the overall range of other Minnesota and Midwestern facilities. After the first year of monitoring is completed, a fatality analysis will be completed to evaluate the species, turbine location, and distance from the nearest turbine for each recovered bird or bat carcass. At a minimum, the fatality analysis will provide per MW and per turbine fatality rate estimates, identify whether any individual turbines are responsible for a significant proportion of fatalities, and assess whether Project fatality rates are lower, similar to, or higher than those reported in similar Minnesota, regional, and national studies.

Annual fatality estimates are typically provided for the following groups: all birds, small birds, large birds, bats, raptors, and eagles (if appropriate, based on fatality counts). The total number of fatalities in each of these groups will be estimated by adjusting for carcass persistence, searcher efficiency rates, and density-weighted search area using a fatality estimator model, assuming a sufficient number of fatalities are detected. Per the MNDNR's recommended PCM survey protocol, two estimators will be used to calculate fatality estimates. The Generalized Estimator (GenEst; Dalthorp et al. 2018) and Huso estimator (Huso 2011, Huso and Dalthorp 2014) will be used.

If estimated fatality rates at the Project align with the rates observed at other wind projects in the ecoregion (see Tables 4 and 5 in Section 3.2.1) and no concerns regarding specific turbines or species groups are identified during analysis, PCM studies will be discontinued after one year. Fatality estimates and other survey results will be discussed with MNDNR and MNDOC-EERA after survey completion.

5.2 Incidental Monitoring

5.2.1 *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, be sensitive to relative use rates and seasonal sensitivities for bald eagles, and to look for eagle casualties while driving between turbines and conducting turbine maintenance. This information will be retained for the life of the Project to continually compile a relative sense of bald eagle use in the Project area so that modifications to the Project avoidance and minimization measures may be implemented as necessary.

5.2.2 *Injured Wildlife Handling and Reporting Protocol*

Any injured wildlife observed during operation of the Project will be left in place until Rose Creek's primary biological/ecological representative has been contacted (see Section 7.3). Rose Creek will then decide the most appropriate course of action, depending on the condition and species of injured animal discovered. All injured raptors, waterfowl, waterbirds, federally or state-listed bird species, and federally or state-listed bats will be promptly delivered to the appropriate rehabilitation center or other approved facility, as specified in the Project's state and federal permits, or as directed by MNDNR or USFWS personnel.

5.2.3 *Carcass Handling and Reporting Protocol*

Any wildlife carcasses observed during operations of the Project will be left in place until Rose Creek's primary biological/ecological representative has been contacted. Figure 10 illustrates the process for handling and reporting any wildlife fatalities documented at the Project.

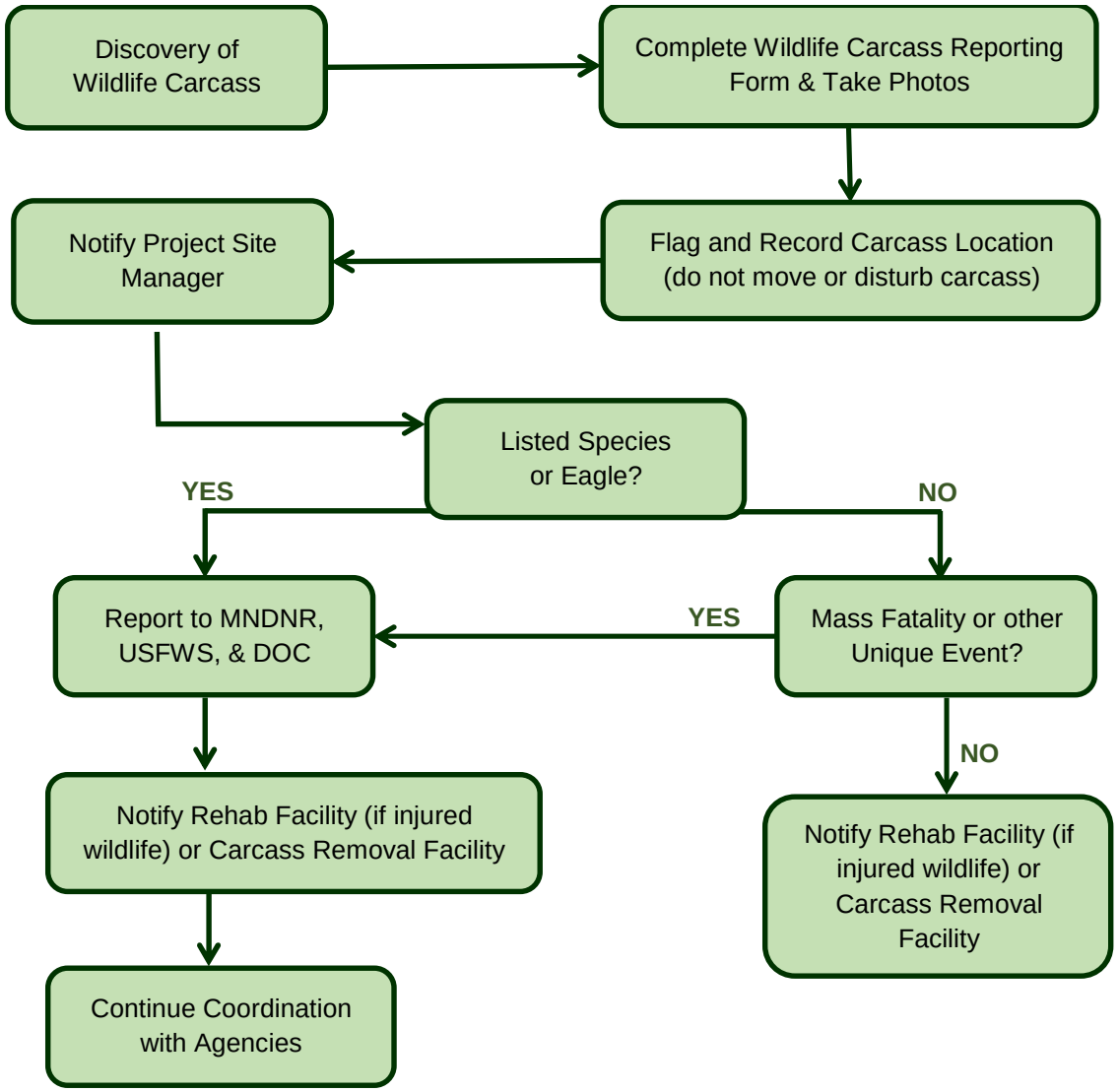

Figure 10. Flowchart of process for documenting wildlife fatalities at the Rose Creek Wind Project.

5.3 Agency Coordination

Extraordinary events (fatality of an eagle, fatality of federally or state-listed species, or large numbers of bird or bat fatalities [typically five fatalities per turbine per survey or 20 per site per facility]) will be reported to the MNDOC-EERA and MNDNR, and USFWS, if applicable, per LWECS site permit requirements. Rose Creek will discuss potentially significant issues and notify these agencies of any adaptive management strategies it plans to implement as a result of formal PCM or informal fatality monitoring.

6.0 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 notes that adaptive management is unlikely to be needed at most wind facilities if they are sited in accordance with the tiered approach. Nevertheless, Rose Creek recognizes the value of applying this approach to its Project activities that include some uncertainty. As such, Rose Creek has incorporated an adaptive approach for the conservation of wildlife potentially impacted by the Project.

Because each bird and bat species has a different population size and risk potential, no specific thresholds for adaptive management implementation are proposed at this time. The dialogue that will occur with the agencies after the first year of PCM survey will include a discussion of whether additional studies should occur to gather more data, or whether adaptive management measures are warranted. If PCM fatality rates significantly exceed expected levels when compared to other recent wind projects in the same region, a process of adaptive management will be used to reduce the Project impacts below a reasonable level, and success or failure of these measures will be documented through additional PCM surveys.

If mass casualties of birds or bats are documented during Project operation, a dialogue with the MNDNR, MNDOC-EERA, and USFWS will occur to determine whether the data are indicative of a particular risk at the Project, and whether and what kind of adaptive management response is warranted.

Thresholds for considering a future adaptive response will include:

- Fatality of an eagle or species listed as endangered or threatened under the ESA or Minnesota Statute;
- Significant levels of fatality of unlisted species of birds or bats; or
- Change in listing status for a species that may occur within the Project area.

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 fatality of the most common species may not be significant. Conversely, lower levels of fatalities of less common species may be of more concern, particularly if these species are of conservation concern (e.g., Minnesota SPC or SGCN).

Finally, Rose Creek 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 federally or state-protected species regulations. In particular, the status of the federally threatened NLEB and potential listing of the little brown bat and tri-colored bat will be monitored, and the BBCS will be updated as appropriate.

In January 2020, the D.C. District Court found that the USFWS decision to list the NLEB as threatened rather than endangered was arbitrary and capricious; the D.C. District Court remanded the listing decision back to the USFWS for reevaluation. The NLEB threatened status and 4(d) rule remain in effect while the USFWS re-examines the NLEB listing decision. Under the 4(d) rule, most incidental take of NLEBs is allowed, including take of NLEBs due to the operation of wind turbines.

The tri-colored bat is not currently federally listed, but was petitioned for listing in June 2016 due to habitat loss and the effects of white-nose syndrome, a disease that infects and often kills hibernating bats, on species populations. USFWS determined that federal listing may be warranted and initiated a status review in December 2017. The little brown bat is currently undergoing a discretionary status review by USFWS for potential listing under the ESA due to white-nose syndrome. ESA listing decisions for both species are anticipated in 2022.

If the 4(d) rule or the status of the NLEB changes or federal listing decisions for tri-colored bat and/or little brown bat are finalized during the operation of the Project, Rose Creek will assess the risks to the species from the Project accordingly and update the BBCS, coordinating with the USFWS and MNDNR, as appropriate.

7.0 IMPLEMENTATION OF THE BIRD AND BAT CONSERVATION STRATEGY

7.1 Document Availability

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

7.2 Reporting

The anticipated reporting requirements associated with the LWECS site permit are described below. Should the final reporting requirements published in the site permit differ, this section will be revised.

7.2.1 *Annual Reports*

By March 15 following each complete or partial calendar year of operation, Rose Creek will file with the PUC an annual report. The annual report will include summarized and raw data of bird and bat fatalities and injuries documented through either formal third-party PCM surveys or incidental monitoring through Rose Creek's Wildlife Incident Reporting System. Rose Creek will provide a copy of the report to the MNDNR and the USFWS at the time of filing with the PUC.

7.2.2 *Immediate Incident Reports*

The MNDOC-EERA, MNDNR, and the USFWS will be notified within 24 hours after the discovery of any of the following:

- one or more dead or injured federally listed or proposed species;
- one or more dead or injured state-listed species or SPC;
- one or more dead or injured bald or golden eagles; or
- five or more dead or injured birds or bats at a single turbine during a single survey (potential mass casualty event).

Should any of these incidents occur, Rose Creek would file a compliance report within seven days of discovery to provide additional details, including the species, turbine location, and date of the discovery, as well as a log of the agency notifications and plans to address the incident, if warranted.

7.3 Primary Contacts

Key resource personnel associated with this BBCS include the following:

Rose Creek's Primary Biological/Ecological Representatives:

- Safety and Environmental Compliance: TBD
  - Mobile: TBD
  - Office: TBD
  - Email: TBD
- Siting and Permitting: Gokhan Andi, Manager, Project Development
  - Mobile: (507) 215-6301
  - Office: (605) 306-6238
  - Email: andig@conedceb.com

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