

Wildlife Surveys and Risk Assessments for the Lexington Chenoa Wind Farm

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WEST Qualifications

- 20 years of experience with wind-wildlife risk and impact studies
- Extensive wind-wildlife experience in Illinois for over 40 proposed and operational wind facilities
- Expert team of biologists, ecologists, and statisticians to guide study design, management strategies, and data analysis
- Established working relationships with USFWS Rock Island Illinois Field Office and Illinois Department of Natural Resources

Survey Objectives

- Lexington Chenoa Wind Farm contracted WEST in 2016 to conduct pre-construction baseline wildlife surveys at the Lexington Chenoa Wind Farm to measure use of, and assess risk to, birds, bats, and other sensitive species from development of the Project
- Surveys followed USFWS *Land-Based Wind Energy Guidelines* (WEG; USFWS 2012), USFWS *Eagle Conservation Plan Guidance* (ECPG; USFWS 2013), USFWS *2017 Range-Wide Indiana Bat Summer Survey Guidelines* (Guidelines; USFWS 2017)
- Lexington Chenoa Wind Farm and WEST established early and frequent coordination with USFWS and IDNR to ensure approval of survey methodologies and discuss results

Summary of Wildlife Surveys Completed in the Project

- Eagle Risk Assessment
- Avian Use Surveys
- Eagle and Raptor Nest Survey
- American Golden-Plover Surveys
- Bat Acoustic Monitoring Surveys
- Bat Habitat Assessment
- Franklin's Ground Squirrel Habitat Assessment

Results from Avian Surveys

- **Eagle Risk Assessment:** lack of potential nesting and foraging habitat in the Project, lack of known eagle nests and use areas, and low rates of bald eagle use during prior avian use surveys
- **Avian Use Surveys:** rate of use is similar to other projects in Illinois; low use overall by protected species: 1 golden eagle, 5 bald eagles, 37 northern harriers, and 8 upland sandpipers observed; no other listed species were observed
- **Eagle and Raptor Nest Surveys:** no eagle nests observed within 2 miles of the Project area; one known bald eagle nest located 5 miles north of the proposed turbine layout
- **American Golden-Plover Surveys:** similar to many projects in Illinois, American golden-plovers were observed in the project; use was lower than what has been recorded at important bird areas: ~ 1,922 individuals observed in 33 groups; majority of groups were foraging on the ground; all groups observed in flight were recorded below estimated rotor-swept height (25-150 meters)

Results from Bat Surveys

Bat Acoustic Monitoring Surveys

- 2,615 bat passes recorded during 469 detector nights for combined mean of 5.8 +/- 1.2 bat passes per detector night
- Majority of bat passes were classified as silver-haired bat (36.3%), eastern red bat (17.9%), big brown bat/silver-haired bat group (17.6%), big brown bat (11.9%), and hoary bat (8.3%); no bat passes were identified as threatened or endangered species
- Activity during fall migration period was 6.6 +/- 1.5 bat passes per detector night (ground), 7.1 +/- 1.4 (50-m raised), and 7.2 +/- 1.8 (80-m raised)
- Within range of other studies in the Midwest that range from 1.9 to 35.7 bat passes per detector night
- Bat fatality rates are expected to be within the range of other Midwest wind energy projects

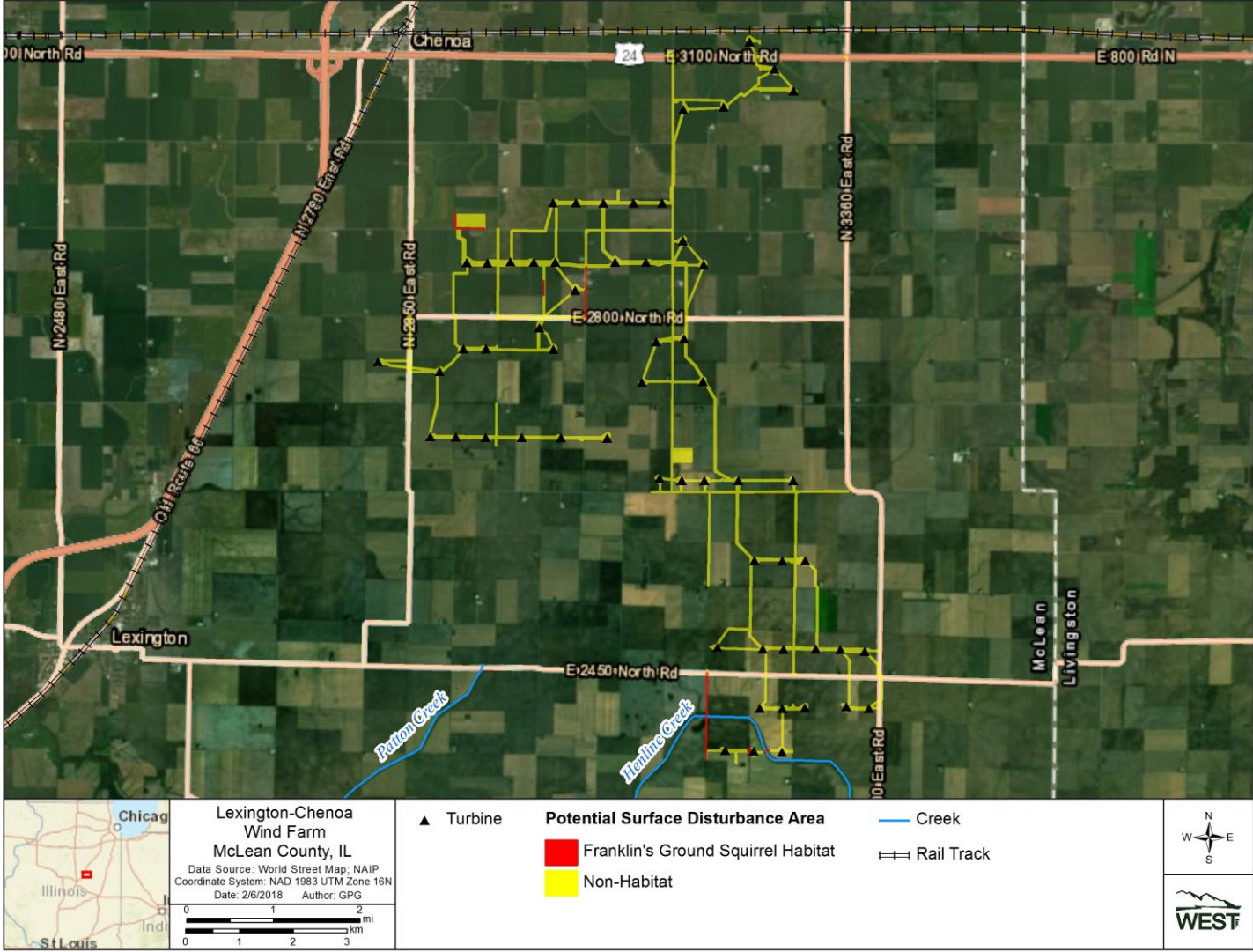
Bat Habitat Assessment

- Habitat assessment for the Project identified seven small, linear shelterbelts totaling 7.7 acres of forest within 1,000 feet of proposed turbines
- All shelterbelts were greater than 1,000 feet from woodlots and are not considered suitable habitat according to USFWS 2017 Range-Wide Indiana Bat Summer Survey Guidelines

Results from Franklin's Ground Squirrel Habitat Assessment

- Majority of land cover within ½ mile of proposed turbine locations is tilled cropland
- There are low amounts of suitable habitat for FGS present in the Project that will be affected by construction activity, including unmown roadside right-of-ways (0.05 acres), unmown grassland/Conservation Reserve Program lands (0.23 acres), shelterbelts (0.32 acres), shelterbelts with trees (2.22 acres), mowed roadside right-of-ways adjacent to suitable habitat (2.76 acres), and mowed grassland adjacent to suitable habitat (0.21 acres)
- Remaining non-cropland areas that will be affected by construction activity were areas of unsuitable habitat for Franklin's ground squirrels, including mowed roadside right-of-ways (15.15 acres) and mowed grassland (1.81 acres)

Results from Franklin's Ground Squirrel Habitat Assessment



Risk Assessment for Eagles

- Project lacks potential nesting and foraging habitat for bald eagles; nearest suitable habitat is 3.5 miles away on the Mackinaw River and outside the typical territory size for bald eagles
- Nearest known bald eagle nest is located 5 miles north of the proposed turbine layout
- Very low use of bald eagles recorded in the Project
- Golden eagles are rarely observed in Illinois, one observation during avian surveys was likely a migrant; only two other golden eagle records reported in McLean County in last 15 years
- Golden eagle habitat is absent from Project and rare in the Midwest
- Risk to eagles from Project is expected to be low

Risk Assessment for Northern Harriers and Upland Sandpipers

Northern Harriers

- Similar to every wind project in Illinois, northern harriers were observed during migration and winter season
- Project lacks suitable nesting habitat (large wetlands and grasslands)
- No fatalities have been recorded in Midwest
- Hunt and fly at low elevations and have low risk of collision with wind turbines

Upland Sandpipers

- Use was low in Project during avian use surveys (only 8 observations over 346 hours of surveys)
- Limited suitable nesting habitat in the Project, including grassland, pasture, and grass buffer strips
- Rarely recorded as fatalities at wind energy projects; majority of them occurring in Nebraska, North Dakota, and South Dakota; no fatalities recorded in Illinois
- Shown to be impacted by displacement in South Dakota near turbines, but continue to use areas of suitable habitat near the Twin Groves Wind Project (K. Shank, personal communication)
- Risk of collision is expected to be low based on low number of fatalities recorded in the Midwest

Risk Assessment for American Golden-Plovers

- Low flight heights of AMGP observed during surveys
- Only one AMGP fatality has been found during 7 years of post-construction monitoring at the Fowler Ridge Wind Farm in Indiana, despite its location adjacent to a known stopover area for AMGP and near the AMGP Important Bird Area
- Studies show that AMGP avoid areas near turbines
- AMGP may be impacted by displacement, but there are other suitable foraging areas outside the Project
- Risk of collision is expected to be low

Risk Assessment for Bats

- EDPR is a leader on bat research and conservation in the wind industry, with involvement in the American Wind Energy Association (AWEA) bat working group, voluntary implementation of the AWEA bat best management practice (feathering turbines below manufacturer's cut-in speed) fleet-wide, as well as Bird and Bat Conservation Strategy (BBCS) documents for all operating projects
- Bat habitat assessment showed Project lacks suitable summer habitat for the federally endangered Indiana bat and federally threatened northern long-eared bat
- To date, only 1 known Indiana bat and 4 known northern long-eared bat fatalities have been documented at wind energy facilities in Illinois
- Risk of collision is not equal throughout range in Illinois
- No records of Indiana bat or northern long-eared bat fatalities in central Illinois at facilities that operated at manufacturer cut-in speeds
- No Indiana bat and northern long-eared bat fatalities were recorded during post-construction monitoring at nearby facilities (Twin Groves, Top Crop, Rail Splitter, Grand Ridge, and other facilities in central Illinois)
- Bat fatality rates, including non-listed bat species, are expected to be similar to other Illinois wind energy facilities, ranging from 3.27 bat fatalities/MW/year at Crescent Ridge, IL (Kerlinger et al. 2007) to 12.6 bat fatalities/MW/year at Top Crop, IL (Good et al. 2013)
- Lexington Chenoa Wind Farm will implement American Wind Energy Association's voluntary best management practices which have been shown to reduce bat mortality by approximately 30% at the Fowler Ridge Wind Farm in Indiana (Good et al. 2012)

IDNR Recommendation #1

The Department recommends the County consider imposing a requirement for the applicant to avoid siting wind turbines within one mile of Weston Cemetery Prairie Nature Preserve.

- All of the turbines are sited over 1 mile away from the Weston Cemetery Prairie Nature Preserve

IDNR Recommendation #2

The Department recommends the County consider imposing a requirement for the applicant to curtail turbine operations below wind speeds of 5.0 meters per second during the period from July 15 through October 15 to conserve endangered, threatened, and non-listed bats.

- The Project is located in central Illinois where threatened and endangered species have not been documented as fatalities, despite extensive monitoring at sites
- Bat fatality rates vary between sites, ranging from approximately 3.27 bat fatalities/MW/year at Crescent Ridge, IL (Kerlinger et al. 2007) to 12.6 bat fatalities/MW/year at Top Crop, IL (Good et al. 2013) at Illinois wind facilities; this is the middle range of bat fatality rates recorded in the Midwest, ranging from 0.16 bat fatalities/MW/year at Buffalo Ridge I, SD (Johnson et al. 2000) to 30.2 bat fatalities/MW/year at Cedar Ridge, WI (BHE 2011)
- Wind projects with low fatality rates have a lower impact on bat populations, consequently feathering at 5.0 m/s would have little benefits to bats if overall bat fatality rates are low
- Lexington Chenoa Wind Farm proposes to address potential risk to threatened and endangered bat species, and non-listed bats, using an adaptive management framework consistent with the US Fish and Wildlife Service Land-Based Wind-Energy Guidelines
- Follow the American Wind Energy Association's voluntary best management practice and feather blades below manufacturer cut-in speeds to reduce bat mortality, which has been shown to reduce bat mortality by approximately 30% at Fowler Ridge, Indiana (Good et al. 2012), during the first fall season of operation
- Lexington Chenoa Wind Farm will monitor the Project's effects on bats using an intensive post-construction monitoring survey during the first two years of operations
- If fatalities include any threatened or endangered species, Lexington Chenoa Wind Farm will coordinate with agencies and take appropriate actions to minimize and mitigate for the impact, which may include an Incidental Take Permit under Section 10 of the Endangered Species Act, and/or an Incidental Take Authorization through the IDNR
- If overall mortality for non-listed bats exceeds the number recorded at the nearby Twin Grove facility (12.4 bats/MW/year), adaptive management measures (e.g., operational curtailment, deterrents) to reduce overall mortality to non-listed species will be applied

IDNR Recommendation #3

The Department recommends the County consider imposing a requirement to conduct three years of mortality monitoring to statistically quantify bird and bat mortality by species due to turbine operations.

- Lexington Chenoa Wind Farm will conduct extensive post-construction monitoring during first two years of operation (monitoring dates will be subject to final commercial operation date) to measure impacts to birds and bats, and determine if additional measures are needed to reduce mortality
- Two years of research at the Heartland wind turbine has shown the same level and species composition of bat mortality (A. Capparella, Ph.D., personal communication)
- Data collected during the first year of post-construction monitoring will be used to address the concerns expressed by the IDNR regarding the potential bird and bat fatalities
- Two potential outcomes will trigger adaptive management responses: 1) the discovery of a threatened or endangered species, and 2) estimation of a bat mortality rate that exceeds the recorded mortality rate at the nearby Twin Groves Project (12.4 bats/MW/year)
- Lexington Chenoa Wind Farm will adjust monitoring methodologies and develop appropriate responses in coordination with the USFWS and IDNR, which may include conducting a third year of post-construction monitoring, if appropriate

IDNR Recommendation #4

The Department recommends the County consider imposing a requirement for the applicant to perform and report fish & mussel surveys 100 meters up and downstream of any proposed physical disturbance of a perennial stream channel or drain associated with Rooks Creek prior to disturbance of the channel.

- No perennial instream impacts are currently proposed by Lexington Chenoa Wind Farm; if it becomes necessary, the applicant agrees to conduct surveys to determine impacts to fish and mussels

IDNR Recommendation #5

The Department recommends the County consider imposing a requirement for the applicant to avoid siting turbines within 500 feet of a perennial stream. Alternatively, the applicant could consider sponsoring scientific research to measure and report the effects of turbine noise, vibration, and flicker on aquatic organisms.

- Majority of turbines in the proposed layout are sited more than 500 feet from perennial streams
- Two turbines are sited within 500 feet of perennial streams, including T-15 (249 feet from unnamed tributary of Rooks Creek) and T-101 (343 feet from Rooks Creek)
- IDNR expressed concern for impacts to aquatic habitats from noise, vibration, and flicker
- Some species are more sensitive to these stimuli; however, no studies have directly assessed these impacts from wind turbines
- Lexington Chenoa Wind Farm proposes to leave these two turbines (T-15 and T-101) that are not impacting an INAI stream within 500 feet and perform before and after (year 1 and year 5) scientific studies that are much needed in order to determine both the necessity and efficacy of such a setback and assess the effects of noise, vibration, and flicker on aquatic organisms; survey methodologies will be coordinated with the IDNR

IDNR Recommendation #6

The Department recommends the County consider assuring no wind turbines are sited within ½ mile of the Mackinaw River INAI Site (Henline Creek).

- No turbines are located within 3.5 miles of the Mackinaw River main channel
- Five turbines (T-76, T-94, T-60, T-61, and T-162) are currently sited within ½ mile of Henline Creek which is part of the Mackinaw River INAI site
- The portion of Henline Creek that intersects the proposed turbine layout is a constructed and maintained drainage ditch that lacks high-quality forest riparian habitat
- The nearest turbine is located approximately 2.5 miles from the forest riparian habitat along Henline Creek
- Lexington Chenoa Wind Farm proposes to meet a minimum setback of 500 feet from the portion of Henline Creek that is not forest riparian habitat to reduce potential impacts to aquatic species; this setback is consistent with the approved setback for Invenergy's project
- Lexington Chenoa Wind Farm will commit to the highest standards of protection to avoid impacts to Henline Creek, and implement a robust Storm Water Pollution Prevention Plan with additional measures to ensure protective provisions are continuously intact (e.g., weekly inspections, inspections after significant rain events)

Questions?



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