



Illinois Department of Natural Resources

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PLEASANT RIDGE EXHIBIT 110

Pat Quinn, Governor
Marc Miller, Director

September 8, 2014

Mr. Charles T. Schopp, Administrator
Livingston County Regional Planning Commission
1110 W. Water St., Suite 3
Pontiac, IL 61764

**RE: Invenergy Wind Energy LLC Pleasant Ridge Energy Facility, Livingston County
Endangered Species Consultation Program
EcoCAT Database Reviews #1410117**

Dear Mr. Schopp:

The Department has received from Stantec Consulting a submission on behalf of Pleasant Ridge Wind Energy LLC for the purpose of consultation between the Department and Livingston County in accordance with the *Illinois Endangered Species Protection Act* [520 ILCS 10/11], the *Illinois Natural Areas Preservation Act* [525 ILCS 30/17], and Title 17 *Illinois Administrative Code* Part 1075. Pleasant Ridge proposes to construct a large wind energy facility in the southern half of Livingston County.

The proposed facility is in the vicinity of a number of records of endangered or threatened species, Illinois Natural Areas Inventory Sites, and Illinois Nature Preserves which could be affected by the construction and operation of such a facility. In addition, the proposed action may adversely affect the essential habitats of species protected by the *Illinois Wildlife Code* [520 ILCS 5] and the *Illinois Fish & Aquatic Life Code* [515 ILCS 5]. The Department's comments and recommendations are provided below.

Gray/Timber Wolf, *Canis lupus*. This species is State-listed as endangered throughout Illinois, but in Livingston County remains protected as endangered under the federal *Endangered Species Act*, as well. Though still rare in Illinois, a female Wolf was killed last winter on Interstate 39 near Tonica in LaSalle County, south of the Illinois River, less than 40 miles from the project area, demonstrating that the presence of one or more Wolves along the Vermilion River in Livingston County is not impossible.

Of the seven Gray Wolves killed in Illinois to date, all have been located in or near forests along streams or rivers. However, another female Wolf was found in a coyote trap (and released unharmed) in a cornfield in Whiteside County in February 2013, indicating that wolves are not restricted to woodlands. Wind turbines and wind farms are not known to pose adverse effects to this species, and none are anticipated. The Department believes it is unlikely the proposed action will adversely affect essential habitat for the Gray/Timber Wolf.

Franklin's Ground Squirrel, *Spermophilus (Poliocitellus) franklinii*. The Franklin's Ground Squirrel has been documented from the Weston Cemetery Prairie five miles west of Fairbury, from Sunbury Township in Livingston County, as well as from locations in Ford and Iroquois County.

The State's largest ground squirrel is most active above-ground on sunny days in late spring and early summer, but this species hibernates for seven to nine months of the year. It prefers taller vegetation than other ground squirrels, and so is seldom seen. More so than other rodents, it feeds on bird eggs, the young of other small mammals, and insects. Well-drained ground is a requisite for burrows. This species is most often found along railroads and highways where its requirements for food and shelter are satisfied, but may also occupy fencerows and grassed waterways. Though there may appear to be little suitable habitat within the project footprint, the species may persist in isolated pockets. The U.S. Route 24 corridor and the adjacent railway, both running through the project area and connecting known locations, offer ideal dispersal corridors for this species.

Offspring can disperse up to six miles in their first season. If present, this species can be threatened during construction through the crushing and collapse of its burrows by heavy equipment. Shadow flicker cast in its territory by operating turbines and turbine noise may also be detrimental. To date, this species has not been documented as occupying the site of an operating wind energy facility in Illinois, so possible adverse effects remain a matter of speculation.

The Department believes the proposed action is unlikely to adversely modify the essential habitat of this species, but contractors working on the project should remain alert to the possibility it may be present.

Bats. The operations of wind energy facilities in Illinois result in the deaths of thousands of bats annually. While many wind turbines produce no bat deaths, some may result in more than 30 mortalities each year, despite the fact most wind turbines are located well away from areas considered appropriate bat habitat.¹ Experience in Illinois, and nationally, has shown the **great majority of bat deaths occur during the annual fall migration period, extending from late July through October, with peak losses in August and September**. The wind energy industry and conservation organizations have produced a significant amount of research investigating why bats collide with wind turbines and how such collisions can be reduced or avoided. **This knowledge is of particular importance for species of bats which are listed as endangered or threatened.**

Indiana Bat, *Myotis sodalis*. The Indiana Bat has been listed as "endangered" by the federal government since 1967, and has been listed by the State of Illinois since 1972. The species was well on its way to recovery and de-listing until the appearance of a deadly disease, "White-Nose Syndrome," a fungal infection first observed in North America in 2006. This disease has decimated hibernating bat populations in the Northeast, and was first detected in Illinois in 2013.

Like other bats, the Indiana Bat is vulnerable to collisions with wind turbines. However, only six such Indiana Bat deaths have been confirmed nationwide through 2013. Because bat mortality monitoring relies heavily on statistical methods, it is likely the actual number lost to wind turbines is greater. **All but one confirmed loss involved female bats killed in September (4) and October (1) during the fall migration**. Two occurred at the Fowler Ridge Wind Farm in Indiana, just east of the Illinois border, in

¹ Locally, a 2011 mortality study at the Iberdrola Streator Cayuga Ridge South Wind Farm estimated bat losses at 6.3 bats/MW or 12.6 bats per turbine.

September 2009 and September 2010. **It is evident migration plays a significant role in losses of this species, so the position of wind turbines relative to hibernation sites and summer colonies could be an important risk factor.** Not all hibernation sites are known, and summer colony locations may shift with forest conditions. Moreover, many of the latter may remain unidentified. The Indiana Bat exhibits a high degree of fidelity to both maternity colonies and hibernation sites, but behavior during migration is still poorly understood.

The entire State of Illinois is deemed to lie within the historic geographic range of the Indiana Bat. The Blackball Mine near LaSalle-Peru, a Priority 2 hibernation site 40 - 60 miles northwest of the project area, is the only federally-designated Critical Habitat in Illinois for this species, but Blackball Mine has seldom exceeded 1,200 Indiana Bats in most winters. Mines and caves with much larger populations occur in Southern Illinois, Southern Missouri, Kentucky, and Southern Indiana. As may be expected, most capture records in Illinois for this species are in the central and southern portions of the State, and are associated with federally-funded bridge and highway projects. Large portions of the State where such projects have been rare have not been thoroughly surveyed. There currently are no capture records for this species from Livingston County; there are records for Ford, Woodford, Marshall, and LaSalle Counties.²

This species can migrate as far as 300 miles between winter hibernation sites and spring maternity colonies, although most documented flights cover considerably shorter distances. A radio-tracking study of female Indiana Bats emerging from the Blackball Mine in late April 2011, sponsored by Invenenergy, revealed that most bats in the study group traveled to maternity colony locations less than fifty miles downstream to the west and southwest.³

However, the sampled group was not large enough to exclude the possibility that Indiana Bats from Blackball which departed earlier followed the Vermilion River (Illinois River Drainage) into Livingston County. A radio-telemetry study is underway which will use newer technology to track bats from their summer maternity colony in northeastern Champaign County to hibernation sites at Blackball or in Indiana.⁴ If Champaign County bats do travel to the Blackball Mine, it is likely they will do so through the proposed wind energy facility in Livingston County, posing a risk of take despite the possible absence of maternity colonies along the South Fork of the Vermilion River. Livingston County is also within the 300-mile radius of other winter hibernation sites in Southern Illinois and Indiana. Thus, **while no Indiana Bats were captured during pre-construction mist-netting for this project, it is possible Indiana Bats will, at least occasionally, be present within or near the proposed wind energy facility.**

Northern Long-Eared Bat, *Myotis septentrionalis*. This species is widely-distributed in Illinois and was considered one of the more common bat species across the state, based on mist-netting capture records. Its ecology and behavior are very similar to that of the Indiana Bat, although its geographic range is much larger, extending to the Rocky Mountains and into Canada. However, this species is highly susceptible to White Nose Syndrome infection, because it selects the most humid portions of

² A 2011 Mortality Study performed for Iberdrola's Streator Cayuga Ridge South Wind Farm, just ten miles north of the proposed facility, collected no bats from the genus *Myotis*; however, by comparison, there is very little potential *Myotis* habitat in the vicinity of that wind farm. Inferences using that data should be applied to Pleasant Ridge only with caution.

³ The study established new Indiana Bat/maternity colony records for LaSalle, Bureau, Putnam, Marshall, and Woodford Counties, where none were previously known. Obviously, our knowledge of this species' distribution is far from complete.

⁴ It is unlikely the results of this study will be available before mid-2015.

caves for winter hibernation, conditions in which the fungus is most virulent. Where the fungus has been present the longest, populations of the Northern Long-Eared Bat have fallen precipitously, or have disappeared altogether.

Consequently, the U. S. Fish & Wildlife Service has determined to list this species as “endangered,” with final listing expected in April 2015. Under the terms of the *Illinois Endangered Species Protection Act* [520 ILCS 10/7], the species will automatically be listed by Illinois on the effective date of the federal listing. On January 3, 2014, the Fish & Wildlife Service Midwest Region issued guidance advising that sponsors of any activity expected to result in the incidental taking of the Northern Long-Eared Bat should proceed as though the species were already listed.

Like the Indiana Bat, wind turbine collisions involving the Northern Long-Eared Bat have been documented only rarely (just over a dozen reported nationwide) and typically during fall migration. However, unlike the Indiana Bat, mortality of the Northern Long-Eared Bat has been recorded at Illinois wind energy facilities, including the Invenergy California Ridge project in Vermilion County in 2013.

During a mist-net survey conducted in July 2011 for the Pleasant Ridge project, five Northern Long-Eared Bats were captured at three different points within and adjacent to the proposed wind farm, at two sites on the South Fork of the Vermilion River and one site on the North Fork. These individuals, comprising 6% of all bats captured, consisted of one adult male, two juvenile males, and two juvenile females. The presence of juveniles indicates maternity colonies in the near vicinity. However, in 2011 this species had not been proposed for listing and the focus of the survey effort was on the Indiana Bat, which was not detected. Consequently, no effort was made to locate maternity roosts of the Northern Long-Eared Bat or to estimate colony numbers. Thus, it must be assumed that suitable forested riparian habitat may be supporting summer colonies of this species wherever such habitat occurs within or adjacent to the project area.

Recent research into overall bat losses has shown that a significant portion, 30% to 50%, of bat losses occur below the recommended cut-in wind speed if rotors are allowed to “free-wheel” when no electricity is being generated. Significant reductions of bat mortality can easily be achieved if the practice is not allowed during bat activity seasons, generally April through October. Bat losses can also be reduced if consideration is given to wind-speed and temperature conditions during operations. For example, all bat activity drops significantly when ambient air temperatures fall below 68° F (20° C) or when wind speeds exceed 6.9 meters per second (15.4 mph). Thus it is possible to manipulate wind turbine operations, using combinations of these factors, to reduce total bat mortality.

Non-listed Bats. The great majority of bats killed at Illinois wind farms consist of the migratory “tree bats,” which do not hibernate, but migrate long distances to exploit summer and winter food resources. These consist of the Eastern Red Bat, the Hoary Bat, and the Silver-Haired Bat, which together account for more than 80% of wind farm bat losses. Myotine bats, a group which includes the Indiana Bat, the Northern Long-eared Bat, and the very common Little Brown Bat, comprise the smallest number of bat fatalities, accounting for less than 4%. Other species, such as the Tricolor Bat (Eastern Pipistrelle), Evening Bat, and Big Brown Bat, account for the remainder.

At present, the U.S. Fish & Wildlife Service is currently evaluating proposals to list the Little Brown Bat, the Big Brown Bat, the Tricolor Bat, the Cave Myotis, and the Southeastern Myotis⁵, all of which are cave-hibernating species adversely affected by White-Nose Syndrome. It is likely one or more of these species will be listed during the useful life of the proposed project.

The Department offers the following recommendations concerning the Indiana Bat and Northern Long-Eared Bat.

Recommendation #1: The County should consider a requirement for the applicant to conduct new mist-netting and acoustic monitoring studies to identify the bat species and bat activity areas within, and in the vicinity of, the proposed Pleasant Ridge facility. Particular attention should be paid to wooded areas along Indian Creek, the South Fork of the Vermilion River, and the North Fork of the Vermilion River. The objectives of the studies should be to identify areas of high bat activity, to identify the locations and sizes of summer maternity and bachelor colonies of listed species, and to attempt to identify the migration routes to hibernation sites used by members of these colonies. Results of the studies should be submitted to the County and to the Department of Natural Resources. Such data will be helpful in determining whether additional permits from the USFWS and IDNR would be appropriate in the future.

Recommendation #2: The County should consider a requirement for the applicant to conduct at least one bat activity season (April-October) of post-construction bat mortality monitoring to establish a baseline for the scale of bat mortality due to normal wind farm operations, and to identify the species sustaining mortality. Establishing a baseline is essential to evaluate the effectiveness of any minimization and avoidance measures adopted later. The USFWS typically recommends three years of such monitoring to improve confidence in the results, but one year's data may be sufficient to begin making important decisions where additional delay would be harmful to conservation of these species.

Recommendation #3: The County should consider a requirement that wind turbine generators be set back at least 1,000 feet from wooded or forested areas which likely provide foraging habitat for bats or provide "commuting" corridors bats may follow between foraging areas. Federal wind turbine siting guidelines suggest this approach; research has shown most myotid bat foraging activity occurs above, along, within, or below the tree canopy. Since nearly all Indiana Bat and Northern Long-Eared Bat losses have occurred during migration rather than during foraging, this measure may be of limited value—one of the migrating Indiana Bats killed at Fowler Ridge was well beyond 1,000 feet laterally from the nearest habitat. Nearly all foraging also occurs below 30 meters (100 feet) in altitude, below the blade sweep of most currently-deployed commercial wind turbines. However, this measure will reduce collision risk for that percentage of flights exceeding 30 meters within 1,000 feet of such habitat.

Recommendation #4: The County should consider a requirement for the applicant to prevent "freewheeling" of turbine rotors at wind speeds below the manufacturer's recommended "cut-in" wind speed between April 1 and October 31 each year.⁶ "Feathering" the pitchable blades to prevent all but

⁵ Livingston County lies outside the geographic range of the Southeastern Myotis, a State-listed endangered species, and the Cave Myotis does not occur in Illinois.

⁶ Generally, cave-hibernating bat species are active away from the hibernation site only between these dates. As climate change progresses, the activity period may be extended before and after these dates. Bats are most active at low wind-speeds,

the slowest rotation is an appropriate practice which can be programmed into turbine control systems for this purpose. Such a practice entails no loss of electrical generation potential and, by itself, may reduce total bat losses by 30% or more.

Recommendation #5: The County should consider a requirement the applicant implement mortality reduction measures during August, September, and October, the peak months for bat mortality.⁷ The Department recommends turbine cut-in speeds be raised (curtailed) to not less than 5.5 meters per second (12.3 mph) between sunset and sunrise whenever ambient air temperatures at nacelle height remain above 15°C (60°F) for a rolling average period of ten minutes. This may be accomplished through feathering turbine blades. Initiating such curtailment at higher wind speeds and/or at lower air temperatures is acceptable. Curtailment reduces total bat mortality by at least 50% to more than 70%. An Illinois wind turbine implementing a similar regime experienced zero total bat mortality in September.^{8,9}

Recommendation #6. The County should consider a requirement the applicant conduct an additional activity season of mortality monitoring following the implementation of minimization and avoidance measures to evaluate their effectiveness. It may be possible to collect baseline and mortality-reduction effectiveness data during the same activity season by dividing sampled turbines into “control” and “experimental” groups.

Recommendation #7. Based on the inferred presence of bachelor and maternity colonies derived from 2011 mist-netting for this project, the Department recommends the County should consider a requirement the applicant make a good-faith effort to obtain an Incidental Take Authorization (ITA) from the IDNR for the Northern Long-Eared Bat, pursuant to Title 17 Part 1080 of the Department's Administrative Rules.¹⁰ The documented presence of the Northern Long-Eared Bat at three widely-spaced locations suggests the species was common along tributaries of the Vermilion River in 2011. This in turn, makes it likely that one or more Northern Long-Eared Bats migrating to winter hibernation sites outside Livingston County will be killed through collision with a wind turbine during the life of the project, even if minimization and avoidance measures are implemented. Such a death is unlawful unless authorized by the IDNR through approval of a Conservation Plan which complies with Part 1080.¹¹

but turbine blades acquire lethal velocity before the generator “cuts in.” Most modern wind turbines “cut-in” at 3.5 m/s (8 mph).

⁷ While bats are killed throughout the active period, research has repeatedly shown that 80% or more of all bat mortality occurs in these three months; this is also true for myotine bats.

⁸ Bat Monitoring Study for the Pigeon Creek Wind Turbine: Curtailment Study for 2012 (DeWitt 2012). Operations were curtailed below 6.0 m/s for the month of September; wind speed was the only variable applied. During two prior years, carcass recoveries averaged 3.5 bats in September. Combining wind speed with ambient air temperatures justifies a slight reduction of the wind-speed curtailment threshold to 5.5 m/s.

⁹ Due to the small numbers of myotine bats involved, curtailment recommendations are based on total bat mortalities, although it is clear that myotine species are far less vulnerable than others. Reductions in total mortality are assumed to proportionately benefit myotine species, but this may not actually be the case.

¹⁰ Obtaining an ITA from IDNR requires a minimum of 150 days after submission, but often requires more time. By agreement with the USFWS, issuance of a state permit is dependent on the prior issuance of a federal permit from the USFWS in cases where a federally-listed species is involved.

¹¹ The only known reduction method which guarantees there will be no prohibited taking is to halt turbine operations after sunset, a practice which could render the project economically infeasible. The take of this species is a rare event during normal operations, and recommended measures reduce this probability further, but the probability of taking will always remain greater than zero. Hence, seeking official sanction for such taking is a prudent measure.

Birds. Commercial wind turbines are also a cause of bird mortality, although at much lower rates than for bats.¹² Instead of being concentrated among a few species, bird mortality occurs across a wide spectrum of species. More than 80% of bird carcasses recovered near wind turbines belong to species of the passerine (song-bird) group, while relatively few are waterfowl or raptors. Vulnerability is associated with migration at night, in conditions of poor visibility or related to lights on turbines, rather than residence in the vicinity of the turbines. Experience has shown it is very difficult to predict the pattern or degree of avian mortality which will be associated with an Illinois wind farm. Wind turbines also influence birds' use of habitat, with some species strongly avoiding their vicinity.

Early guidelines suggested marking turbine blades with various patterns or contrasting colors to increase visibility. However, subsequent research has shown that such markings are ineffective in reducing mortality, but increase the likelihood that birds (and other wildlife) will be displaced from nearby habitat, which is undesirable. A physical phenomenon known as "motion smear" has the effect that, as a bird approaches a turbine, the rotating blades become less visible, starting with their outer edges, until, when a bird is close enough to be struck, the blades are virtually invisible. Consequently, the Department does not recommend blade markings as a means to reduce avian mortality.

Most birds which die from collisions with manmade objects are killed at towers taller than 600 feet from the ground surface. All commercially available wind turbines in the United States have a maximum height below 500 feet. Night lighting on towers is strongly associated with avian collisions. Research has shown that no lighting is best, but federal aviation safety regulations require lights on any object taller than two hundred feet. Flashing red lights pose the least risk; steady white lights the greatest. For reasons poorly understood, lights appear to alter a bird's flight path, causing it to circle closer to the light until it comes into contact with turbine blades (or, in the case of communications towers, with guy wires). Flashing lights still result in mortality, but to a lesser degree than steady lights. FAA regulations allow towers on the inside of a wind farm to go unlit, so long as the perimeter towers are lit, and the FAA has been studying regulations which allow the deployment of radar-based warning systems which illuminate the towers only when an aircraft is in dangerous proximity.

Wind turbines also affect the use of habitat. Some species of birds are very sensitive to the presence of vertical structures and cannot use habitat close to them. Other species may be more sensitive to the visible motion of wind turbines, and avoid flying near or over them. This effect is known as displacement or exclusion, and is most important when essential habitat is highly fragmented or relatively rare. Such may be the case with grasslands or wetlands.

Loggerhead Shrike, *Lanius ludovicianus*. The State-listed endangered Loggerhead Shrike is a grassland bird which prefers grasslands with scattered trees and shrubs. It feeds on large insects, such as grasshoppers, and small mammals. One indication of its breeding territory is a number of insect/small animal carcasses impaled on twigs, spines, and thorns; due to the bird's beak structure, prey is more easily consumed if it has been allowed to partially decay. Once common when farming was far more diversified, the species has become rare due to habitat loss as pastures and fencerows have been converted to row-crops.

¹² Typically, an Illinois wind turbine may kill zero-to-six birds of varying species annually.

The Shrike is widely-distributed across Illinois. The nearest documented Shrike breeding record since listing is a 2007 record located in McLean County five miles west of Fairbury. Shrikes are most likely to be present on the edges of riparian corridors, along roadsides, at cemeteries, and even near homesteads, where conditions may offer a prospect of successful reproduction.

Wind turbines present the greatest collision threat to this species during migration. Breeding territory flights are likely to remain below turbine blade sweeps. Otherwise, a nest may be threatened if trees are removed along roads to facilitate transportation of wind turbine components, or are removed to reduce the prospect of turbulence diminishing turbine efficiency. If trees are to be removed when Shrikes may be present, they should first be carefully observed to avoid harming an active nest.

To date, no Loggerhead Shrikes have been confirmed to be killed by wind turbine collision in Illinois. The Department believes it is unlikely habitat essential to the Loggerhead Shrike may be adversely affected by the proposed wind farm.

Upland Sandpiper, *Bartramia Longicauda*. This State-listed endangered grassland bird prefers habitat of short-grass prairie/pasture. For many years this ground-nesting species was thought to be area sensitive, requiring ten acres or more of grassland habitat for successful breeding. However, many recent breeding efforts are occurring in grassed waterways of row-crop fields, which provide considerably less than ten acres of habitat, and from along roadsides.

A 1994 breeding record for the Upland Sandpiper exists for an area along the County Line three miles southeast of Chatsworth, and three other breeding records were established in 2005 near Blackstone in northwestern Livingston County, indicating this species may be found across the County where suitable habitat exists. A lack of recent observations does not prove the species is absent from any given area. This species is likely very responsive to Conservation Reserve programs which may temporarily provide suitable habitat.

The Upland Sandpiper engages in an aerial courtship display which passes through the rotor-swept elevations of utility-scale wind turbines, and may place it at risk of collision mortality. Whether this species is sensitive to the proximity of vertical structures or to what degree, or to shadow "flicker" on potential nesting areas, has not been demonstrated.

Upland Sandpipers in Stephenson and McLean Counties have continued to use habitats near commercial wind farms, although data collected in those cases has been insufficient to determine what effect the presence of turbines may have had on breeding territory selection. No members of this species have been reported as killed by wind turbines in Illinois, and the Department is unaware of such reports elsewhere.

Nevertheless, this species may remain vulnerable to collision during migration. Otherwise, the main risk may be the unintentional disruption of a breeding territory established in marginal habitat, such as a grassed waterway, during construction. Even relatively small areas of appropriate habitats should be checked for the presence of this species prior to any initiation of construction disturbance during the breeding season. The Department has issued one Incidental Take Authorization for this species where that prospect seemed likely.

The Department believes the proposed action is unlikely to adversely affect the essential habitat of the Upland Sandpiper.

Osprey, *Pandion haliaetus*. The State-listed endangered Osprey is a fish-eating raptor for which there are no breeding records in Livingston County or surrounding counties. However, in September 2007 a migrating juvenile Osprey was injured at a McLean County wind farm, apparently while attempting to perch on a wind turbine, but was able to fly when released the following day. At the time, there were no records of Ospreys in McLean County or surrounding counties.

Due to competition with larger and more aggressive raptors, many young Ospreys are reared on manmade structures such as communication towers, utility poles, bridges, highway signs, and even athletic field lights. Unlike many species of birds, young Ospreys are solitary migrants, nor do they follow waterways, as might be expected of fish-eating birds, but travel overland. Their familiarity with human structures may produce a tendency to try to perch on similar structures, such as wind turbines. While this is the only known instance of a wind turbine-Osprey interaction in Illinois, it is impossible to predict whether it will ever be repeated, or where that might occur. However, as the species recovers, nesting along the tributaries of the Vermilion River becomes more likely.

The Department believes it is unlikely the proposed action will adversely modify essential habitat for the Osprey.

Black-Billed Cuckoo, *Coccyzus erythrophthalmus*. There are no breeding records for this State-listed threatened species in Livingston County; however, appropriate habitat may be found along the outer edges of riparian woodlands and remaining fencerows or small woodlots. Two members of this species have been confirmed killed at Illinois wind farms in the last two years (one in Henry County in July 2012; one in Vermilion County in September 2013) where there was no evidence of nearby nesting.¹³

Two instances hardly establish a trend, but no other State-listed birds have been confirmed as killed at wind farms, although commercial wind turbines have been operating in the State for a decade. Moreover, each was killed within a few weeks of beginning operations at that installation. This suggests migrants are at greatest risk¹⁴ and that further mortalities may be anticipated in those locations. Because in neither instance was this species identified during pre-construction avian use surveys, it highlights the difficulties of predicting or anticipating such events, as well as that of devising or implementing measures to minimize or avoid them. No specific risk factor has been identified which could be addressed to reduce the risk of taking this species.

If avoidance and minimization are not possible, mitigation could address potential losses through providing, improving, and protecting potential nesting habitat suitable for this species. To provide protection from liability for prohibited taking, such mitigation efforts would have to occur pursuant to a

¹³ The closely-related, but not listed, Yellow-Billed Cuckoo, *Coccyzus americanus*, has been reported as killed at several Illinois wind farms, including at the Streator Cayuga Ridge South Wind Farm, suggesting that the long-distance migrants of this genus may have an elevated vulnerability.

¹⁴ Although nesting records for this species exist for central and south-central Illinois, these are at the southern edge of the breeding range. Far greater numbers nest north of Illinois, in Wisconsin, Michigan, and Canada. Thus, most Black-Billed Cuckoos in Illinois will be those traveling to and from those out-of-state breeding grounds. Nevertheless, such individuals are legally-protected while within Illinois' borders. So far as is known, migration occurs over a broad front, and not through specific corridors or flyways. The species winters in South America.

Conservation Plan as part of an Incidental Take Authorization issued by the Department of Natural Resources. In the absence of substantial evidence the proposed action would result in prohibited taking, the Department believes the decision whether and how to respond to this risk may be left with the applicant. The Department believes the proposed action is unlikely to adversely modify the essential habitat of the Black-Billed Cuckoo.

Northern Harrier, *Circus cyaneus*. A pre-construction avian assessment commissioned by the applicant observed a number of the State-listed endangered Northern Harriers in the project area during the spring migration season. It was not determined whether any of these birds established nesting territories within the project area. Suitable breeding habitat is rare or absent in this part of Livingston County; it is unlikely that this species will establish nesting territories in the area to be affected.

Generally, even during migration, the Northern Harrier is a low-level flier, with few observed flights reaching altitudes which will be swept by commercial wind turbines. Moreover, post-construction avian assessments at existing Illinois wind farms have documented the complete absence of this species after turbines begin operation, regardless of their frequency or occurrence previously. This suggests the Northern Harrier avoids the vicinity of wind turbines; several factors may be responsible.

Northern Harriers may be sensitive to turbine motion or to verticality. However, the most probable explanation may be related to wind turbine noise.¹⁵ Contrary to folklore, many birds of prey, including the Northern Harrier, hunt primarily by sound, not by sight, since their usual prey, mice and voles, are often well-screened by grasses and other covering vegetation. Harriers may simply be unable to locate food because the noise from operating wind turbines prevents them from hearing and locating targets. This phenomenon has been well-documented by research conducted near pipeline pumping stations, where exploding rodent populations have been attributed to the absence of avian predators, which cannot accurately target them due to continuous machinery noise.

This hypothesis has not been tested in Illinois. Nevertheless, rather than mortality, the greatest effect of the proposed wind farm on this species is likely to be its near-complete displacement from lands within the wind farm. Post-construction avian assessments of this project are likely to fail to observe any individuals of this species. While construction of the project is likely to reduce available migration habitat for this species, absent documentation of any breeding sites within the project area, the project cannot be said to adversely affect *essential* habitat for the Northern Harrier.

Whooping Crane, *Grus americana*. The Western Flock of Whooping Cranes, which migrates between Texas and Saskatchewan, is on the federal endangered species list. The Eastern Flock, which migrates between Wisconsin and the eastern Gulf of Mexico, is designated as an “experimental” population, not so protected, although its success is essential to recovery of the species as a whole. However, its members are covered under the federal *Migratory Bird Treaty Act*; it is not a state-listed species in Illinois.

The Eastern Flock is most famous for one of the methods used to re-establish its migration pathways. Each year, a group of around a dozen chicks propagated from captive cranes in zoos is trained to follow

¹⁵ Illinois Pollution Control Board noise regulations are intended to protect workers and nearby residents from industrial noise; they have no relationship to wildlife sensitivities. Thus, compliance with IPCB standards has no bearing on potential adverse effects to wildlife.

an ultra-light aircraft, which leads them on daily journeys across the landscape from Wisconsin to wintering habitat in Florida.¹⁶ They are left to find their own way back to Wisconsin. This program has been under way for more than ten years. The Eastern Flock, which once did not exist, now numbers more than 100 birds. A few pairs have successfully nested and reared a chick, suggesting this effort to establish a population separate from the Western Flock may ultimately be successful.

The route followed by the guided chicks for the last several years passes through Livingston County, between stops in LaSalle County and Piatt County. The proposed wind farm will straddle this route. Over the years, the route has been adjusted to avoid wind farms, partly as a matter of pilot safety, but also as a matter of minimizing risk to the crane chicks. The pilots typically fly at around one thousand feet, well-above the reach of wind turbines, but cranes require considerable distance to ascend or descend from that altitude, and occasionally a chick has refused to fly over a wind farm, and must be individually led around the facility by a second aircraft. Pilots post daily logs on the Internet, so such incidents are well-documented and read by thousands of school children and interested adults who follow their progress closely.

Older cranes are not escorted on either the spring or fall migration. Cranes are not acrobatic flyers, and the largest losses to the Eastern Flock have been due to collisions with power lines. Cranes will periodically rest on their journeys, choosing a pond or wetland as a temporary roosting area, and will forage in the surrounding countryside (corn is a favorite food) out to about 20 miles, during which their flights rise only to several hundred feet. Returning cranes have been reported all over Illinois, but are not strangers to Livingston County. Each bird wears unique leg bands and a number also wear satellite tracking devices so their migration behavior can be better understood.

To date, no member of the Eastern Flock has collided with a wind turbine in Illinois or Indiana, but the proliferation of commercial-scale wind energy facilities in both States creates an increasing risk such an event may occur. The death of a Whooping Crane by collision with a wind turbine would not only be a setback for the crane recovery program, but a public relations problem for the operator of the wind turbine involved. The fall movement usually spans September through December, while spring migration begins as early as January and may extend as late as May.¹⁷ The Department strongly suggests the owner/operator of the proposed facility coordinate closely with the USFWS and Operation Migration to provide specific turbine locations so that pilots may avoid them, and to monitor older migrating cranes which may be in the vicinity.

American Golden Plover, *Pluvialis dominica*. This non-listed migratory bird breeds in the Arctic tundra, migrates south along the Atlantic seaboard to Argentina in the winter, but returns northward through central North America in the spring. Areas of Illinois and Indiana provide important spring migration staging areas, which may be occupied by this species for a month or more while birds go through a molt before resuming migration. It has become a species of concern due to its relatively low global population estimate of around 300,000 birds.

¹⁶ “Operation Migration” is a non-profit volunteer organization of pilots and ground crews using techniques pioneered with Canada Geese, working in partnership with the USFWS and other organizations. Young cranes do not know instinctively that migration is necessary, and must learn from their parents the routes to follow. The pilots serve as surrogate parents, and both pilots and ground crews wear crane costumes to minimize the risk chicks will become accustomed to humans.

¹⁷ Returning Whooping Cranes have been reported loitering in the vicinity of Danville in mid-June.

Based on 25 years of Spring Bird Count data, it is likely that significant numbers of this species congregate in Livingston County, within or adjacent to the project footprint. Because large operating wind energy facilities already exist or are currently under construction in Livingston and neighboring Counties, it is possible Plovers which usually stage elsewhere may be displaced into Livingston County. Large numbers of this species are routinely observed south of Sibley Grove in Ford County. Pre- and post-construction surveys should be performed to observe this species.

Plovers tend to aggregate in dense concentrations in a few areas, rather than being spread over the landscape. However, where these may be located may be influenced year-to-year by poorly understood climatic cues. The species feeds on soil invertebrates around shallow ephemeral wetlands in farm fields,¹⁸ preferring the short stubble of soybeans, but spends the night on the ground in the stubble of corn fields, moving between these habitats at dawn and dusk.

Research has established this species is highly intolerant of breaks in habitat and is highly sensitive to vertical structures. The species is seldom observed closer to roads than 70 meters, and research at the Fowler Ridge wind farm in Indiana, a site formerly supporting up to 25,000 Plovers, has shown that this species will not use habitat any closer to a wind turbine than 400 meters (a quarter mile). Plover use of the Fowler Ridge vicinity numbers fewer than 250 birds annually.

It is now clear that a wind energy facility displaces this species nearly entirely from migratory staging habitat it requires to arrive on Arctic breeding grounds in good condition. Given that the Illinois landscape is divided by roads on section lines, “interior” field habitats have been critical to this species, but this is precisely the area where public safety setbacks place wind turbines. The combination of roads and wind turbines can place entire townships off-limits for the Golden Plover between one migration and the next.

A county policy which preserves open space containing suitable migration staging habitat for this species would be an important initiative to prevent the American Golden Plover from being placed on the endangered species list.

Bald Eagle, *Haliaeetus leucocephalus*. Although no longer classified as an endangered species, the Bald Eagle remains fully protected under the federal *Bald and Golden Eagle Protection Act* (BGEPA). While only about a half dozen Bald Eagles are known to have been injured or killed by wind turbines throughout North America, federal guidelines call for specific evaluation of threats if Eagles are known to have an important activity area (feeding, nesting, or roosting) within ten miles of a wind turbine. The closest known Bald Eagle nest to the proposed project is located about 12 miles northwest of Pontiac on the Vermilion River (Illinois River Drainage).

However, the Illinois population of resident Bald Eagles has been rapidly increasing over the last five years. The active nest northwest of Pontiac was first reported in 2011. Elsewhere in Illinois, even small rivers and larger creeks are seeing the establishment of new Bald Eagle nesting territories. The Department believes it is very likely Bald Eagles will establish new nests within ten miles of the proposed project, or even within its footprint, during the life of the project. When such an event occurs,

¹⁸ Such ephemeral farmed wetlands are threatened by agricultural drainage practices which do not require any government authorization, but which are often promoted through government-sponsored cost-sharing programs.

the developer should consult with the U. S. Fish & Wildlife Service, which has primary jurisdiction for this species.

Golden Eagle, *Aquila chrysaetos*. In contrast to the Bald Eagle, hundreds of Golden Eagles have been killed by wind turbines; differences in hunting ecology are thought to explain this outcome. Most such deaths have been in the West. The Golden Eagle is not known to nest in Illinois and, because the Department tracks Eagle nests rather than Eagles, themselves, the Department has very little data on its use of Illinois habitats.

The species is known to winter in Illinois, with larger numbers to the north and diminishing southwards. Nevertheless, this species has been observed south of St. Louis and, in October 2013, an injured Golden Eagle was recovered from a field southwest of Willard Airport near Champaign-Urbana. Consequently, the proposed project is well within the Golden Eagle's winter range, although it is impossible to develop any reliable estimate of likely numbers or spatial distribution. The developer and operator of the project, if different, should remain aware of the possibility of interactions with this species.

Recommendation #8: The Department recommends the County consider a requirement for the applicant to perform at least one full season of post-construction avian mortality monitoring of sufficient intensity to characterize the losses to be expected from this installation. A report of the results should be provided to both the County and the Department of Natural Resources. This information should be analyzed to determine whether additional permits or authorizations may be necessary. The USFWS typically recommends three years of such monitoring to improve confidence in the results, but one year's data may be sufficient to begin making important decisions where additional delay would be harmful to conservation of these species.

Aquatic Species. Aquatic environments may be altered through the construction and operation of wind turbines. Local roads and their attendant drainage structures (ditches, culverts, and bridges) may need improvement to support construction traffic, or significant repair following construction, while many miles of new permanent private roads must be constructed to service and maintain the turbines. Such roads have the potential to create siltation and sedimentation off-site, to alter drainage patterns, to disrupt drainage tiles, and to alter the thermal regimes of receiving streams. Operating turbines may cast shadows on water bodies and produce acoustic and kinetic vibrations which may adversely affect the activities of aquatic animals. Aquatic animals in marine environments have the option to avoid the vicinity of wind turbines, but those confined to streams, ponds, and lakes cannot or, if they can, their responses may fundamentally alter the aquatic ecology upstream or downstream of wind turbine installations.

Slippershell Mussel, *Alasmidonta viridis*; Spike Mussel, *Elliptio dilatata*; Unusual Concentrations of Mussels. The Department takes special note of high-quality stream segments with a high diversity of aquatic life; streams containing ten or more species of Unionid bivalve mussels are designated as "unusual concentrations" because, in modern times, that level of mussel species diversity is relatively rare, even where none of the tallied species are individually listed as endangered or threatened. And, because the mussel life cycle cannot be completed without fish (and often specific fish), a diversity of mussels is also indicative of high fish diversity. Taken together, these are indicators of healthy aquatic ecosystems.

Portions of the North Fork of the Vermilion River and Felky Slough support unusual concentrations of mussels. (See the INAI descriptions below.) Though these segments lie outside the footprint of the proposed wind farm, they may not lie beyond its influence.¹⁹ No segments of the South Fork of the Vermilion have been so designated, but many reaches nearly qualify. Meanwhile, the State-listed threatened Spike Mussel is known from the main stem of the Vermilion River just above Pontiac, and the State-listed threatened Slippershell Mussel has been documented in Indian Creek upstream of Fairbury.

Mussel inventories are far from comprehensive. Even the best sampling techniques discover only about 50% of the mussels which are present in the searched area, and those which prefer deeper waters or faster currents require significantly greater levels of effort to find. The presence of the Slippershell in Indian Creek suggests this species is also present throughout the South Fork Vermilion River watershed in the smaller tributaries, including channelized drains. This species' reproductive cycle includes periods of parasitism on two fish, the Johnny Darter and the Mottled Sculpin. As these fish move about, juvenile mussels drop off into whatever habitat the fish is above at the moment. If conditions are right, the mussel survives. Thus, a mussel's offspring may not be found in the same stream as the parent, so long as the host fish was able to move into other parts of the watershed. The same is true for the Spike Mussel, which may well occur in either Fork of the Vermilion River upstream of the location it was documented.

Mussels are sessile, and can move only short distances on their own, and then not quickly. It is difficult for them to avoid sudden changes in habitats or environmental conditions. They are vulnerable to sedimentation and siltation, channel scouring, sudden changes in water temperature, pollutants, changes in predator populations, and the loss of fish host species. It may also be directly or indirectly vulnerable to acoustic or kinetic stimuli.

Most of the fish and mussels of the Vermilion River system are dependent on clean water flowing over exposed sand, gravel, and cobble substrates. Soil erosion can result in sedimentation that covers such substrates with silt and mud, smothering mussels and filling the interstitial spaces which are important for the invertebrate species which are the foundation of the aquatic food chain. Hence, it is important that erosion of disturbed soils is carefully controlled.

In a very flat landscape, relatively minor changes in elevation can have large effects on the sizes of watersheds and the direction and force of sheet flow across the soil surface; it is important that final grading restore the prior existing contours as much as possible to minimize in-stream erosion or aggradation that can result from permanent flow volume changes.

Most aquatic animals thrive in cooler water, and many smaller stream temperatures in Illinois are moderated by water emanating from agricultural drain tiles, which tends to remain very stable in the mid-50-degree range. Besides reducing the volume of flow, exposing and drying out habitats which are usually under water, wind turbine construction can significantly alter the thermal regime of small streams if flows from drain tiles are disrupted for any length of time.

¹⁹ In Scotland, wind turbines have been banned within 10 kilometers (six miles) of a military installation whose primary mission is the detection of nuclear test-ban treaty violations around the world, because their kinetic vibrations interfered with seismometers. Although lacking any assessment of biological effects, this investigation established that land-based wind turbines emit detectable kinetic waves at that range.

Very little attention has been given to the potential adverse effects of shadow flicker on fish and wildlife; discussions of this aspect of turbine operation typically focus on effects to human residents. It is tempting to believe fish become accustomed to these moving shadows and ignore them, but there are no studies which show this is true. It is equally possible these rhythmic light pulses prevent fish from using habitats where they occur, or significantly elevate stress levels, or modify feeding and breeding behaviors, both during the day and at night. A number of turbines proposed for this project have the potential to cast shadows on various tributaries of the South Fork Vermilion River for longer or shorter portions of the year, as well as on the North Fork of the Vermilion River, itself.

Some streams may seem unimpressive but may be important to the reproduction of smaller fish and mussels. Slippershell mussels may also be present in some smaller streams. Because mussels are dependent on fish to complete their life cycle, the exclusion of fish from such habitat would have negative implications for sustaining mussel populations. The effects of shadows on these species are unknown, but this effect of wind turbines was previously absent and is unlikely to be benign or neutral in influence.

Except in marine environments, the ecological effects of terrestrial and underwater acoustic and kinetic vibrations emanating from operating wind turbines have not been investigated, and the majority of those studies have placed a focus on effects to marine mammals, or on shock waves produced by construction activity which are strong enough to kill fish outright. Vibrations can enter the water through the ground or through the air, or both. Generally speaking, the intensity of sound waves attenuates rapidly with distance, depending on both its frequency and initial power.

Fish have two physical systems which enable them to detect and respond to pressure waves in the water: ears and lateral lines. These systems allow them to detect and navigate around obstacles, find food, and avoid predators. Very loud sounds which produce strong pressure waves can cause mortality through rupturing swim bladders and damaging other internal organs.

Hearing provides fish with relatively long-range information about their environment. More is known about the physical aspects of fish ears than about their function: many species can be identified through ear bone structure alone, but the hearing ranges of only slightly more than 100 fish species worldwide have been determined. Of these, most cannot hear sound above 1,000 kilohertz, although some species can hear sounds as high as 3,000 kilohertz. (By comparison, most humans can hear sounds between 20 hertz and 20,000 kilohertz.) Low-frequency sounds, those most likely to affect fish, travel the greatest distance.

By contrast, the lateral line, composed of sensitive cells along the length of the fish's sides, provides short-range information about the animal's immediate surroundings, within one or two feet. It is the lateral line which allows fish to "school," an important survival defense strategy.

The current project can be expected to increase the present level of acoustic and kinetic "noise" in the vicinity. This noise differs in character from other human-generated noises from traffic and machinery because, whenever turbines are operating, the noise will be continuous, rather than intermittent. Moreover, because numerous similar sources will be distributed widely across the countryside, the intensity and effects of such noise will not be uniform as energy waves interact, and numerous variations

in the transmissivity of soils and waters will also increase the variation in noise expressed at selected points.²⁰

The Department has no expectation that construction or operation of wind turbines will result in any direct mortality of amphibians, fish, or mussels. However, acoustic/kinetic effects could produce behaviors which adversely affect the sustainability of local populations. Acoustic/kinetic effects could place key aquatic habitats off-limits to some species and adversely affect the fitness of species which remain. For example, should acoustic/kinetic effects exclude host fish from the presence of adult female mussels, there will be no mussel reproduction, recruitment, or colonization in that portion of the stream, leading to a higher probability of species extirpation.

A number of species of fish migrate upstream and downstream during their reproductive cycles. Many require a special riffle habitat to spawn, whereas the remainders of their lives are spent in deeper pools downstream. Acoustic/kinetic effects have the potential to disrupt migration patterns or prevent the use of specific spawning habitats, again resulting in lower productivity and increased chances of species being extirpated from the watershed.

Acoustic/kinetic effects also have the potential to disrupt feeding by simply increasing the ambient noise level in aquatic environments, masking sounds which indicate a food source. Conversely, increased noise levels may also make predator avoidance more difficult. Under ideal conditions for electricity generation, the noise will occur continuously, unlike any other sounds in the environment which are not natural in origin.

If acoustic emissions from wind turbine operation plausibly alter the behavior of animals which are listed as endangered or threatened, the behavioral impact may rise to the level of prohibited taking (harassment).

Most biological survey efforts focus on larger streams, with relatively fewer and more sporadic surveys of smaller tributaries. Thus, there is little basis to assess the importance that smaller tributaries may have for the health of the overall river system, or to know how far upstream endangered populations are distributed, either on a permanent basis or seasonally.

As noted, the acoustic and kinetic effects of wind turbines on terrestrial aquatic systems have not been studied. However, effects may be subtle, and even observed changes in aquatic ecosystems cannot be attributed to wind turbines unless baseline studies have documented conditions existing prior to construction and operation of a wind farm. While the Department cannot state with confidence that the acoustic and kinetic effects of wind turbines will adversely modify aquatic environments, any such changes are unlikely to be beneficial to aquatic systems.

Recommendation #9: The County should consider requiring the prompt repair or replacement of disrupted agricultural field tiles to minimize disturbances to the flow and thermal regimes of receiving streams.

²⁰ When energy waves intersect, the force of the waves can be increased (amplified) or diminished, even cancelled (interference). The physical locations where such phenomena occur will change with the frequency (wavelength) of the respective waves, which will be largely determined by the rotational speed of the turbine rotors. Even if all relevant variables could be quantified, it would be difficult to model where and when effects would occur.

Recommendation #10: The County should consider requiring grading of disturbed areas to reflect as nearly as possible the original surface contours, to minimize alterations of watershed catchments.

Recommendation 11: The County should consider requiring the effective implementation and maintenance of erosion control measures to minimize pollution, siltation, and sedimentation in receiving streams to protect aquatic habitats.

Recommendation #12: The County should consider requiring the applicant to perform acoustic/kinetic studies to determine the range, strength, and frequencies of aquatic noise generated by wind turbine operations.

Recommendation #13: The County should consider requiring the applicant to perform biological surveys of each stream and channel within the project area and its near vicinity to characterize the invertebrate, mussel, fish, and amphibian communities which are present, with follow-up studies at intervals to monitor changes which may be attributable to wind turbine operation. Surveys in the winter and early summer may capture important seasonal movements.

Weston Cemetery INAI Site and Nature Preserve.

The five-acre dedicated Weston Cemetery Prairie Nature Preserve is located just east of Weston, McLean County, about four miles from the nearest proposed turbine location, and distant enough that it will be unaffected by any direct physical effects of the proposed action (unless kinetic effects extend that far). However, it is likely that wind turbines will be visible from the Nature Preserve. Such visibility will diminish the ability of visitors to envision pre-settlement conditions within the Preserve. However, McLean County has authorized a wind farm much closer to the Preserve²¹ and, when constructed, the turbines of that facility will be more obtrusive than those of the Pleasant Ridge project. The Department believes the proposed action is unlikely to adversely modify conditions within Weston Cemetery Prairie Nature Preserve in any manner which could be observed without scientific instrumentation.

Sibley Grove INAI Site and Nature Preserve.

The 50-acre dedicated Sibley Grove Nature Preserve is located just southeast of Sibley, Ford County, outside of the footprint and more than five miles distant from the nearest proposed wind turbine, so that it will be unaffected by direct effects of the proposed action (unless kinetic effects extend that far). However, because this Nature Preserve is largely wooded, turbines will be visible to visitors only from its perimeter. Moreover, Ford County has approved a wind farm²² whose turbines, when constructed, will be much closer to Sibley Grove, with correspondingly greater potential effects. The Department believes the proposed action is unlikely to adversely modify conditions within Sibley Grove Nature Preserve in any manner which could be observed without scientific instrumentation.

Fugate Woods Nature Preserve. This nature preserve, located near the confluence of Indian Creek with the South Fork Vermilion River just northeast of Fairbury, although open to the public and maintained by a non-profit organization, is not a dedicated Illinois Nature Preserve recognized by the

²¹ The EDPR Bright Stalk Wind Farm.

²² The BP Ford Ridge Wind Farm.

Illinois Nature Preserves Commission, nor has it been deemed eligible for inclusion on the Illinois Natural Areas Inventory by the Department of Natural Resources. It is not known to contain any species of plant or animal currently listed by Illinois as endangered or threatened. Hence, it is not a site subject to the consultation process of Part 1075, nor is it entitled to the legal protections conferred by the *Illinois Natural Areas Preservation Act*.

Nevertheless, Livingston County may wish to consider potential adverse effects to this location because it is known to support maternity colonies of the Northern Long-Eared Bat, scheduled for federal listing as “endangered” in early 2015, and proposed for listing by the Illinois Endangered Species Protection Board. Were this species already listed, this site would be the subject of Part 1075 consultation. It also supports maternity colonies of the Big Brown Bat, *Eptesicus fustus*, and the Evening Bat, *Nycticeius humeralis*, both of which are vulnerable to wind turbine collisions.

The proposed wind turbine nearest Fugate Woods will be approximately one kilometer (0.6 miles) north, and well-beyond 1,000 feet from the nearest tree-line, thus satisfying the federal guideline for turbine-siting protective of bat maternity colonies. Turbines will be readily visible from the margins of the preserve, and may from time-to-time be audible to humans within the preserve under operating conditions.

Felky Slough – Saunemin Reach INAI Site. Felky Slough is a tributary stream which enters the North Fork of the Vermilion River about 5.5 miles southwest of Saunemin. In 2004, Felky Slough supported ten species of native mussels, although none were State-listed as endangered or threatened. The lower end of the designated reach is about two miles as the crow flies from the nearest proposed wind turbine, and thus is potentially within range of acoustic/kinetic vibrations emanating from several project turbines. Fish passing upstream to Felky Slough through the North Fork will pass within 1,000 feet of the nearest turbine, which could create a “choke point” affecting the numbers and timing of fish moving up- or downstream. The Department believes the proposed action has the potential to adversely modify Felky Slough INAI Site through the propagation of acoustic or kinetic energy.

Recommendation #14: The Department recommends the County consider a requirement the applicant establish an instrumented monitoring station at the lower end of the Felky Slough - Saunemin Reach INAI Site to identify and monitor the frequency, duration, and amplitude of acoustic and kinetic vibrations in the INAI Site which may be emanating from project wind turbines. The Department recommends a second such station in the North Fork of the Vermilion River at the point nearest a project wind turbine for comparison.

North Fork Vermilion - Charlotte Reach INAI Site. This INAI Site extends along the North Fork and Kelly Creek about three miles south of Cullom. In 2004, this INAI Site supported 12 species of native mussels, although none were State-listed as endangered or threatened. The Department believes the proposed action has the potential to adversely modify this INAI Site through the propagation of acoustic or kinetic energy.

Recommendation #15: The Department recommends the County consider a requirement the applicant establish an instrumented monitoring station at the lower end of the Charlotte Reach INAI Site to identify and monitor the frequency, duration, and amplitude of acoustic and kinetic vibrations in the INAI Site which may be emanating from project wind turbines.

Sibley State Habitat Area

This 643-acre property of the Department of Natural Resources is located about one mile southwest of Sibley, Ford County, about five miles south of the project area. The SHA is undergoing grassland restoration, and provides breeding, wintering, and staging habitat for a number of migratory bird species, including Northern Harriers and Short-Eared Owls. Pleasant Ridge wind turbines will be visible from the Sibley State Habitat Area. However, Ford County has authorized a wind farm²³ whose turbines, when built, will be directly adjacent to the SHA. Any adverse effects experienced by the SHA will be attributed to those machines.

Consultation on the part of the Department is closed, unless Livingston County desires additional information or advice related to this proposed action. In accordance with 17 Ill. Adm. Code 1075.40(h), the County must notify the Department of its decision regarding these recommendations, whether it will:

- Proceed with the action as originally proposed;
- Require the action to be modified per Department recommendations (please specify which measures if not all will be required); or
- Forgo the action.

This consultation is valid for two years unless new information becomes available which was not previously considered; or the proposed action is substantially modified; or additional species, essential habitats, or Natural Areas are identified in the vicinity. The natural resource review primarily reflects the information existing in the Illinois Natural Heritage Database at the time of this consultation, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments.

If additional protected resources are encountered during the project's implementation, the applicant must comply with the applicable statutes and regulations. Closing consultation does not imply IDNR's authorization or endorsement of the proposed action. Please contact me if you have questions regarding this review.

Sincerely,



Keith M. Shank
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²³ The BP Ford Ridge Wind Farm.