



Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov

Pat Quinn, Governor
Marc Miller, Director

August 23, 2013

Mr. Eric Sadler
County of Kankakee Planning Department
189 E. Court St., Room 201
Kankakee, IL 60901

**RE: Grant Park Wind Farm, Sumner Township, Kankakee County
Endangered Species Consultation Program
EcoCAT Review #1307377**

Dear Mr. Sadler:

The Department has received a submission from General Energy Corporation pertaining to a proposed 19-turbine 50-megawatt wind farm north of Grant Park, mainly in Sumner Township, for the purpose of consultation with the Department 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.

The Department believes a wind energy facility in this vicinity may be likely to alter the essential habitat of the State-listed and federally-listed endangered **Indiana Bat**, *Myotis sodalis*, and/or other bats which may become listed in the near future. The facility is also likely to alter or adversely modify essential habitat for the State-listed **Starhead Topminnow**, *Fundulus dispar*; the **Ironcolor Shiner**, *Notropis chalybaeus*; the **Weed Shiner**, *Notropis texanus*; and the **Slippershell Mussel**, *Alasmidonta viridis*. The potential exists to modify habitat for other State-listed species. The Department offers the following information and recommendations.

Indiana Bat, *Myotis sodalis*. Wind energy facilities have proven to be a major cause of bat mortality in the Midwest, including Illinois. This comes as a surprise to many, who expect that a bat's ability to use echo-location would allow bats to avoid wind turbines. Although the reasons are not yet clear, this is manifestly not the case. Unlike birds, bats have low reproductive rates and can less easily replace losses. In addition, those bat species which hibernate in the winter are being decimated by a new disease, White Nose Syndrome, which is also resulting in declining numbers.

The proposed facility will be approximately 14 miles from the nearest known maternity colony location for the Indiana Bat, on the Kankakee River near Schneider, Indiana. It is about 70 miles east of the

nearest known winter hibernaculum for this species near LaSalle, Illinois. (It is thought unlikely that Indiana Bats from the Schneider colony hibernate in LaSalle.) The Indiana Bat has been shown to migrate as far as 300 miles between hibernaculum and summer colonies, but lesser distances are more common. In Illinois, Indiana Bat movements and activity appear to correlate closely with riparian corridors and wooded fencerows when large forest blocks are unavailable.

The proposed facility will be located between Exline Slough and Trim Creek. Only Trim Creek exhibits a wooded riparian corridor, while several properties nearby and within the project area possess significant ponds where bat foraging activities may focus. To date, five Indiana Bats in the United States have died through collisions with utility-scale wind turbines (none, so far, in Illinois). Three of these losses occurred in terrain very similar to that present in Sumner Township. A recent study in Ohio showed Indiana Bats to be active over open fields as far as 2,900 feet (more than half a mile) from the nearest tree habitat. If the species is present along Trim Creek, wind turbines in this vicinity will pose a risk of prohibited taking.

In addition, the United States Fish & Wildlife Service is currently evaluating petitions to consider several other bat species for federal listing. Furthest along in this process is consideration of the **Northern Long-Eared Bat**, *Myotis septentrionalis*, also known as the Northern Myotis. Currently, the Northern Long-Eared Bat is thought to occur in all Illinois Counties, including Kankakee County. This species has also proven vulnerable to collisions with wind turbines.

The Fish & Wildlife Service is also evaluating the **Little Brown Bat**, *Myotis lucifugus*, for listing. This species is present in all Illinois Counties, including Kankakee County. The Little Brown Bat is the *Myotis* species most often killed at wind turbines (though far outnumbered by members of other genera).

Should the Service decide to list either of these additional species, they will be added to the Illinois List at the same time, as a matter of law. Compliance with both the federal *Endangered Species Act* and the Illinois *Endangered Species Protection Act* will be required.

Commonly, wind project developers perform pre-construction studies in and around the area of the proposed facility in an effort to determine the existing levels of bat activities and the species comprising local bat populations. Several vendors have available acoustic monitors specially designed to register and record bat calls for later analysis using proprietary softwares. Many bat species can be positively identified by their calls. This is less true, however, for species in the *Myotis* genus, whose calls are more difficult to differentiate. In recent years, the most valuable approach has been to place monitors on meteorological towers, one near ground level, and one as near the apex of the tower as possible. (Different bat species tend to use different elevations during active periods.) This method has been successful in estimating the amount of bat activity near monitoring stations. Generally, bat activity begins in early to mid-April and extends through October into November.

While an acoustic analysis may indicate the presence of a species, it cannot indicate numbers, gender, or reproductive condition. A mist-netting survey is needed for this purpose. The Department strongly recommends that points *outside* the proposed wind farm, as well as those within, be included in mist-netting surveys. In this case, points along Pike Creek, within the City of Grant Park (particularly around Lake Matonga), and along Trim Creek southward toward the Kankakee River may be most productive. Exline Slough, though it runs across the proposed project area, appears to lack appropriate mist-netting

set points in the vicinity of the proposed wind energy project. Maternity indicators, such as lactation, are limited to June and early July, with the former being an optimal month for such surveys.

While the presence of any Indiana Bats in the vicinity is a matter for concern, many federal conservation guidelines are related to the proximity of maternity colonies. The mean foraging distance from a maternity colony of the Indiana Bat is often stated to be 2.5 miles (4 km), suggesting that female bats may forage as far as 5 miles (8 km). Generally, the location of a day roost can only be determined through the use of radio-telemetry. Surveyors conducting mist-netting operations should be equipped to attach radio transmitters and track any Indiana Bats (or others bats of interest) so that day roosts can be identified. Elsewhere in Illinois, a lactating female was tracked three miles (5 km) to her roost from the point of capture, while several other Indiana Bats were tracked lesser distances to other roosts. This data can be invaluable in devising impact-minimization and mitigation strategies.

Should Indiana Bats prove to be present, various strategies are available to reduce the risk of prohibited taking, though none offer assurance no taking will occur.

Studies have shown that total bat mortality may be reduced by half or more simply by immobilizing turbine blades at wind speeds below the manufacturer's recommended "cut-in" speed. Below those speeds, no electricity is generated even when blades are in motion. Immobilization can be achieved by use of the mechanical braking system or by using the pitch-control motors to "feather" the blades. Nearly all commercial-grade large turbines are equipped with both systems.

Recommendation #1: The County should consider requiring the applicant to acoustically evaluate the presence of bat species in the vicinity.

Recommendation #2: The County should consider requiring the applicant, concurrent with acoustic monitoring, to conduct mist-netting surveys in the vicinity to positively identify bat species, genders, ages, and reproductive conditions.

Recommendation #3: If Indiana Bats are found to be present, the County should consider requiring the applicant to use radio-telemetry to attempt to identify the location of tree roosts used by this species and define its foraging territory. A decision can then be reached whether to seek Incidental Take Authorization from the Department of Natural Resources.

Ironcolor Shiner, *Notropis chalybaeus*; Weed Shiner, *Notropis texanus*; and Starhead Topminnow, *Fundulus dispar*. These three small fishes may be adversely affected by the proposed wind energy facility.

The Ironcolor Shiner and Weed Shiner are typically found in low-gradient streams or pools over largely-sand substrates, while the Starhead Topminnow can use a wider range of stream and pool habitats. The Ironcolor Shiner has been found as far upstream in Trim Creek as Grant Park, but all three have been found in Exline Slough and/or Trim Creek, and each species can use very shallow water in very small streams. Shiners are noted for their springtime upstream migrations. It is likely these species are present for all or significant parts of the year in these streams and their tributaries where they cross or approach the wind energy project area.

Commercial-scale wind turbines may adversely affect aquatic environments through siltation and sedimentation, thermal alteration, shadow-flicker, acoustic effects, and electro-magnetic fields.

All construction activity entails the risk of siltation and sedimentation from disturbed soils. Access roads and turbine foundations require substantial excavations, and the improvement or repair of local roads and bridges to accommodate heavy and extra-wide loads can be an additional source of silt and sediment. It is imperative that adequate erosion and storm water management measures be in place throughout the construction period.

Many fields contain agricultural drain tiles, which are an important source of cool, clear water for many rural streams. Most tile drainage has a temperature around 54 degrees Fahrenheit, and these waters moderate temperatures in streams, which often lack shade. This is highly beneficial to aquatic life. The installation of service roads, underground power collection cables, and the movements of heavy equipment often crush or damage drain tiles, shutting off these sources of water. This can dramatically and suddenly raise temperatures in the stream, rendering habitat unsuitable, even deadly, for some species.

Shadow-flicker is normally considered only in the context of a potential nuisance to local residents. However, the sweeping movements of these shadows across fields and streams can have the effect of harassing animals in the affected zone. Shadow-flicker likely causes elevated stress levels associated with the well-known fight-or-flight threat response. Distance is the only practical means to alleviate flicker effects.

Three turbines are proposed for locations less than a thousand feet from Exline Slough, on both sides of the stream, which means that stream reach will be impacted by flickering shadows for nearly all daylight hours every day of the year with clear skies. Moreover, flicker can also occur on clear nights with a moon phase which provides sufficient light. If these fishes are present in Exline Slough they may experience harassment, at best; at worst, these species may not be able to pass upstream or downstream, isolating populations on either side.

The situation on Trim Creek is not so problematic, with the nearest proposed turbine being at least half a mile from Trim Creek itself. Although shadows can reach that far, they will be of relatively short duration and only in the late evening, just before sunset. However, there is a tributary running from within the wind farm which may be more seriously affected; it has a deciduous tree canopy which will moderate the sharp edges of shadows, but light levels on the stream will still be noticeably modulated. If these species are present in this tributary, harassment or exclusion could also occur.

The acoustic effects of terrestrial wind turbines on aquatic life are poorly understood. It is known that even non-operating turbines vibrate in the wind, and acoustic pulses originating with the turbines are transmitted into both the ground and the air, from which they can pass into ponds and streams. Of the few fish whose hearing ranges have been established, most cannot hear frequencies above 1,000 Hertz, so it is low frequency sound which is of greatest concern.

Noise can certainly affect fish behavior: they can be startled into a threat response, which interferes with normal feeding behavior, or it can simply interfere with feeding to the extent that noise or vibration are useful in finding food. Continuous noise from wind turbines will elevate stress levels.

Fish in a pond cannot escape these effects and may eventually acclimate to their presence. Fish in a stream are not constrained to develop a tolerance, they can move away from the source of irritation. Consequently, acoustic turbine effects have the potential to displace or exclude fish from reaches of a stream where the noise is intolerable. This can interrupt normal seasonal movements related to spawning, thus interfering not only with feeding but with reproduction. Increasing distance is the only practical means to minimize or avoid acoustic effects.

The Department is hampered in evaluating potential effects by a lack of data on acoustic pulse generation and aquatic propagation from modern turbines on the one hand, and a lack of data specific to the responses of these species to acoustic stimulation on the other. Manufacturer data on turbine noise is typically limited to noise experienced through the air at a given range over the full range of generated frequencies (which may be sufficient to address noise impacts to humans).

The Department currently lacks information on the placement of collection power lines needed to route electricity from each turbine to the substation, but it is clear that at least one such line will be placed beneath Exline Slough. Typically, such cables are placed at least four feet underground. Conductors create both electrical fields and electro-magnetic fields. Soil cover will effectively cancel or control the electrical field but does not affect the extent of the electro-magnetic field, which is likely to extend upwards into the stream channel and, due to its close proximity, will be many times stronger than that experienced from an overhead power line. How aquatic organisms respond to magnetic fields is poorly-understood. It is possible the presence of an electro-magnetic field across the stream could act as a barrier to movement in the stream environment. The strength of the electro-magnetic field is directly proportional to the strength of the current through the conductor and the physical distance between the conductor and the stream channel. Cables with special radio-frequency shielding are available to eliminate electro-magnetic fields in critical areas.

Recommendation #4: The County should consider a requirement the applicant prepare and implement a soil erosion control plan which minimizes the potential for soil erosion and sedimentation during construction.

Recommendation #5: The County should consider a requirement the applicant prepare and implement a plan to promptly repair or replace any field tiles or drains which enter Exline Slough or Trim Creek, that are damaged or destroyed during construction,.

Recommendation #6: The County should consider a requirement for the applicant to survey the fish fauna in Exline Slough and Trim Creek within a mile of the project area, across seasons, to confirm the presence of listed fish species and variations in seasonal populations, both before and after operation of the wind farm. The species of most interest may not be reliably detected using electro-shocking technology; net seining may be necessary to assure smaller fishes are adequately sampled. If no listed species are ever present, the question of prohibited taking will not arise. The recommendations which follow presume one or more listed species are present at some time during the year.

Recommendation #7: The County should consider a requirement the applicant monitor water quality in Exline Slough and Trim Creek within a mile of the project area upstream and downstream to identify other factors which may explain the death, injury, or disappearance of listed fishes. It is apparent both

streams already experience episodes of degraded water quality in the vicinity of the project. The Beecher waste water treatment plant is located upstream on Trim Creek, while that of Grant Park is located downstream. Both streams may receive elevated levels of fertilizers and pesticides from farming operations which boost Biological Oxygen Demand (BOD) or poison aquatic organisms. It will be helpful to both the applicant and to wildlife officials to have data which may explain injuries or fish-kills resulting from causes having nothing to do with the project's operations.

Recommendation #8: The County should consider a requirement to locate Turbines #1, #2, and #3 at least 1,000 feet from Exline Slough, if feasible. Increasing the distance will reduce adverse effects to Exline Slough from shadow flicker and acoustic vibrations.

Recommendation #9: The County should consider a requirement the applicant model shadow flicker affecting Exline Slough and Trim Creek, detailing the dates and hours when blade shadows will lie across the streams.

Recommendation #10: The County should consider a requirement the applicant commission or perform laboratory studies designed to assess the sensitivities and responses of the listed species present in Exline Slough and Trim Creek to shadows which simulate the expected periodicity and intensity of shadows cast by the proposed wind turbines. Experiments and scientific studies involving listed species require special permits from the Department pursuant to Part 1070. Results should be reported to both the County and to the Department of Natural Resources.

Recommendation #11: The County should consider a requirement the applicant conduct pre-construction and post-construction monitoring of acoustic noise levels in Exline Slough and Trim Creek which demonstrate the range of natural and human noise sources, such as traffic and farm equipment. The applicant should provide a report to the County and the Department of Natural Resources discussing any changes in the acoustic environment attributable to operation of the wind turbines.

Recommendation #12: The County should consider a requirement the applicant commission or perform laboratory studies designed to assess the sensitivities and responses of the listed species present in Exline Slough and Trim Creek to acoustic vibrations which simulate the expected acoustic emissions of the proposed wind turbines. Results should be reported to both the County and to the Department of Natural Resources.

Recommendation #13: For any power line which must cross beneath a stream, the County should consider a requirement the applicant use a shielded cable which prevents an electro-magnetic field from intersecting the stream channel. In the alternative, the stream should be crossed with an overhead power line.

Recommendation #14: The County should consider a requirement the applicant commission or perform laboratory studies designed to assess the sensitivities and responses of the listed species present in Exline Slough and Trim Creek to electro-magnetic fields which simulate the expected strengths of fields generated by power lines planned beneath either stream. Results should be reported to both the County and to the Department of Natural Resources.

Recommendation #15: In the event laboratory studies indicate shadow flicker, acoustic vibrations, or electro-magnetic fields alter the behavior or physiology of any listed fishes, the County should consider requiring the applicant seek and obtain from the Department of Natural Resources an Incidental Take Authorization pursuant to 520 ILCS 10/5.5 and Part 1080 of the Department's Administrative Rules.

Slippershell Mussel, *Alasmidonta viridis*. The State-listed threatened Slippershell Mussel is documented in both Exline Slough and Trim Creek, at locations upstream and downstream from the proposed wind energy project area. It is thus very likely individuals of this species are present in the stream reaches within and close to the project area.

Adult Slippershells are less than two inches in total length and are typically found in sand and gravel substrates. This species occupies the highest stream reaches in a watershed and is capable of surviving up to 30 days with no water flow. (Because the Beecher waste water treatment plant is located upstream on Trim Creek, the no-flow condition should be rare or absent in Trim Creek.) Like other mussels, the Slippershell is a filter-feeder, siphoning plankton from the water flowing by.

The Slippershell is unlikely to be sensitive to shadows, and its response to electro-magnetic fields is unknown, but it may be sensitive to acoustic stimulation. As with most mussels, its primary defense mechanism is withdrawal into its shell, which precludes feeding. Its greatest vulnerability may be its reproductive ecology.

Like other Unionid mussels, the Slippershell males eject sperm into the water, which are then siphoned in by downstream females. When the resulting larvae (glochidia) have matured, they in turn are ejected into the stream, where they must come into contact with a host fish within a few hours or perish. The larvae encyst on the gills or other tissues of the host fish, being nourished by its blood supply until the first shell is developed, which may take several weeks. When ready, the juvenile mussel then drops off the host onto the streambed to begin its independent existence.

Males may release sperm in the late spring (May/June). This species is a long-term brooder; females may hold developing glochidia for nearly a year. Gravid females have been found from August through the following April, when mature larvae are apparently released. Hence at least two years of data are necessary to detect a change in reproduction success, and even longer term data is needed to determine a trend.

Perhaps the key step in this reproductive process is attaching to a suitable host fish. Some mussel species can use a fairly wide range of fish hosts, but many are restricted to one or two fish species. For the Slippershell Mussel, the only known fish hosts in this region are the **Johnny Darter**, *Etheostoma nigrum*; and the **Mottled Sculpin**, *Cottus bairdii*. If these species are not present when glochidia are ejected from the female Slippershells, there will be no successful reproduction. Hence, it is important to know whether these species of fishes are sensitive to the presence of operating wind turbines.

Recommendation #16: The County should consider a requirement for the applicant to survey the Exline Slough and Trim Creek within a mile of the project area to confirm the presence of a Slippershell population in the vicinity of the wind farm, both before and after operation of the wind farm. "Hand-picking" by experienced aquatic biologists is the most reliable method of detecting mussels. August and September are often the most productive months for surveying due to lower water levels.

Recommendation #17: The County should consider a requirement for the applicant to survey the fish fauna in Exline Slough and Trim Creek within a mile of the project area, across seasons, to confirm the presence of host fish species for the Slippershell Mussel during its reproductive period (April-June), both before and after operation of the wind farm. These species may not be reliably detected using electro-shocking technology; net seining may be necessary to assure these fishes are detected, if present. Captured specimens should be examined for glochidial encystment and subsequently monitored in aquaria for successful release of juvenile mussels. While these fish species are not themselves listed, permits from the Department pursuant to Part 1070 will be necessary if they are thought to host a listed mussel.

Recommendation #18: The County should consider a requirement for the applicant to conduct the same experiments as those in Recommendations #10, #12, and #14 for the Johnny Darter and the Mottled Sculpin to determine if turbine operations are likely to exclude these species from areas where Slippershells are present.

Recommendation #19: the County should consider a requirement for the applicant to conduct the same experiment as Recommendation #12 for the Slippershell Mussel to determine its sensitivity to acoustic vibrations.

Recommendation #20: If the Slippershell Mussel is present at any point within 500 feet of a proposed underground power line stream crossing, the line should be installed through the directional-boring technique to avoid any disturbance of the stream channel. Generally, even hand-picking may only detect 50% of the mussels actually present, and open trenching through a stream produces adverse effects over a much larger area than just the crossing point.

Other potentially-present listed species. Among aquatic state-protected species in the Kankakee River basin are three which are extremely difficult to detect by standard survey methods: the **Mudpuppy Salamander**, *Necturus maculosus*; the **Salamander Mussel**, *Simpsonaias ambigua*; and the **Northern Brook Lamprey**, *Ichthyomyzon fossor*.

The Mudpuppy Salamander, which reaches a length of one foot as an adult, is an entirely aquatic salamander which never leaves the water. This is because, unlike other salamanders, it never becomes an air-breather, relying on external gills throughout its life. This species is intolerant of warm water—temperatures above 72°F are stressful, while those above 78°F are fatal. During warm weather, this species generally stays in deeper pools and larger streams where temperatures are favorable, but field tile drainage, typically averaging 54°F, can allow it to exploit smaller streams where the temperature is moderated by field tile outfalls. This may be the case with Exline Slough and Trim Creek.

This species migrates upstream to spawn on gravel riffles in November or December, and females then descend again before laying eggs in late February or March on the undersides of logs or rocks. Consequently, headwaters are occupied by this species only during the colder months, when little if any fish sampling is done. Moreover, electro-shocking, the most common method of fish sampling, relies on the fact that fish have swim bladders that cause them to float to the surface when stunned, making them easy to spot and collect. Mudpuppies may be stunned, but they don't float and are not collected in this manner. Baited minnow-traps or seine nets can be used to capture this species, but general surveys of

aquatic fauna seldom target this species. Most records are the result of incidental captures by fishermen, since this species occasionally is taken with hook-and-line methods, or due to the occasional fish-kill, when they are found among the casualties. In addition, this species is primarily active nocturnally.

Altogether, these factors mean this species usually goes unremarked. Exline Slough and Trim Creek offer headwater spawning areas and temperatures moderated by tile drains. The Mudpuppy is widely distributed in the Kankakee River basin, so it is likely this species is present in these streams, at least during the cooler parts of the year.

Relevant to the presence of wind turbines, the Mudpuppy is equipped with a very sensitive lateral line of sensory cells which not only detect acoustic vibrations in the water but are believed to be sensitive to electrical fields. Consequently, an electro-magnetic field through the stream channel may create a barrier to movement, while vibrations from operating turbines may also dissuade individuals from passing through the noisy zone. The species may also be sensitive to shadow-flicker, although being primarily nocturnal, flicker related to moon-phase is more important than the daytime flicker normally modeled. The concern is that the presence of operating wind turbines could isolate Mudpuppies from traditional spawning areas, thus adversely affecting its reproductive success.

The Salamander Mussel is so-named because, unlike all other North American mussels which depend on fish hosts to complete their life cycles, *Simpsonaias ambigua* relies on a salamander host for its glochidia to mature. But only one species of salamander will do—the Mudpuppy Salamander. It is possible to have a population of the Mudpuppy Salamander which is not associated with a population of the Salamander Mussel; but it is impossible to have a population of the Salamander Mussel without the presence of the Mudpuppy.

The Salamander Mussel, which is also a candidate for federal listing as endangered, has been documented from a number of locations in the Kankakee River itself, but is not limited to larger streams. This mussel is seldom found during standard mussel surveys because of its relationship with its host. Because it encysts on the Mudpuppy, mature mussels drop off in the locations where the Mudpuppy spends most of its time: beneath rocks and logs in deeper pools. These areas are seldom as thoroughly searched during mussel surveys, even in shallow areas where hand-picking is most feasible. Consequently, this species is routinely under-sampled and under-reported.

If there are locations in Exline Slough and Trim Creek suitable for Mudpuppy nesting, it is possible the Salamander Mussel is also present. Potential adverse effects to the Salamander Mussel from the presence of wind turbines are the same as those for the Slippershell Mussel.

The Northern Brook Lamprey is possibly the most under-sampled and under-reported fish in North America, due its life-cycle biology. (A study in Minnesota demonstrated that this species, thought to be very rare there, is in fact abundant when surveyed in a manner consistent with its life cycle.) This species is non-parasitic, so it is not found on other fish when they are captured. Though its life span is approximately five years, the first four years are spent as non-swimming larvae (called *ammocoetes*) which bury themselves in stream sediments and filter-feed on plankton and detritus carried in the stream current. In the autumn, mature larvae transform into free-swimming adults, up to five inches long but often smaller, which then travel upstream to gravel riffles to spawn in February/March. Adults do not

eat anything, and die soon after eggs are laid in pools containing vegetative detritus. Dead adults are soon consumed by other animals.

This life cycle contributes to the rarity of its records. As a larva, it is sometimes detected during surveys to assess water quality using macro-invertebrates. It is present as an adult only in cold weather when streams are often frozen over and few fish surveys are done. Because adults do not eat, it is never accidentally taken by hook-and-line fishing.

Even so, all but one record of this fish in Illinois is from the Kankakee River, and it is likely that nearly every tributary creek supports this species during spawning runs. Like other species of fish, it much prefers cooler water, but tile drains may create suitable habitat areas within Exline Slough and Trim Creek so that it may be present year-round.

Very little is known about this species' larval behavior. Concerns for this species are similar to those for the Mudpuppy Salamander and the other listed fishes: whether wind turbines create barriers to migratory movements to and from spawning grounds or interrupt feeding behavior due to acoustic vibrations.

Recommendation #21: The County should consider requiring the applicant to perform stream surveys using appropriate methods during appropriate seasons to detect the presence of the Mudpuppy Salamander, the Salamander Mussel, and the Northern Brook Lamprey in the stream reaches within one mile upstream or downstream of the proposed wind energy facility. Results should be reported to both the County and to the Department of Natural Resources.

Recommendation #22: If any of the three species is detected, consideration should be given to seeking an Incidental Take Authorization from the Department of Natural Resources, pursuant to Part 1080.

Listed Migratory Birds. Thirty species of migratory birds are listed as threatened or endangered by Illinois [see Title 17 Part 1010, Illinois Administrative Code]. However, only nesting records are maintained. Illinois has few geophysical features which influence migration pathways, so that migrations are generally “broad-front” in character. This means that, during migration seasons, any of these thirty species could fly over or through the proposed wind energy facility.

The western shore of Lake Michigan does influence bird movements, especially for raptors during the autumn, and many southward-moving birds skirt the outer edges of the Chicago metropolitan area before spreading out again. The proposed wind energy facility is just slightly over 30 miles from the southern tip of Lake Michigan and only fifteen miles from the South Suburbs, so that this proximity may increase the risk that larger numbers of migratory birds, including listed species, may be killed or injured at this facility than at others in Illinois.

It is difficult to quantify this risk. To date, only two listed birds are known to have been “taken” by commercial wind turbines in Illinois: an Osprey in McLean County in 2007 and a Black-Billed Cuckoo in Henry County in 2012. Neither of these species is deemed particularly vulnerable to wind turbine collisions, and in neither case was there a nesting record for that species in that County. Available data is clearly insufficient to assess the probability of taking a listed species during migration.

However, impacts to migratory birds are more likely to concern behavior than fatalities. For grassland species, especially, there is data to show that nesting birds are displaced from the vicinity of turbines, though the reasons for displacement remain unclear. However, there are no grasslands in the vicinity of the proposed facility, so this concern is of little consequence in this case. Nevertheless, this facility may be expected to produce higher-than average avian losses due to its location.

Recommendation #23: The County should consider a requirement the applicant conduct pre-and post-construction studies of avian use of the project area and surrounding vicinity (up to one mile outside the project boundaries) to detect any changes in use patterns as a result of construction and operations.

Recommendation #24: The County should consider a requirement for the applicant to perform at least one full year of avian mortality monitoring to evaluate whether this facility produces a higher-than-normal mortality rate.

Eagles. The **Bald Eagle**, *Haliaeetus leucocephalus*, and the **Golden Eagle**, *Aquila chrysaetos*, are both protected pursuant to the federal *Bald and Golden Eagle Protection Act*. While only five Bald Eagles have been documented to have been killed by wind turbines in North America, dozens of Golden Eagles have fallen victim to wind turbine collisions. The difference is largely due to their hunting strategies: Bald Eagles feed primarily on fish, while Golden Eagles prefer land-based prey and often hunt from a perch.

Illinois has experienced an on-going explosion in its Bald Eagle population, both in terms of pairs breeding in Illinois and those wintering here. Currently, the Department has no records of Bald Eagles nesting in Kankakee County, but that condition is unlikely to persist much longer. Several pairs now nest in Cook County, while other pairs are nesting in Champaign, Vermilion, and Ford Counties. Several pairs are now nesting on the Fox River, as well as the upper Illinois River. It is simply a matter of time before pairs take up residence along the Kankakee River and its tributaries.

While Golden Eagles do not nest in Illinois, they are increasingly common cool-season visitors, wintering in Illinois as far south as St. Louis on the Mississippi River. In October 2012, an injured Golden Eagle was recovered from a field southwest of Champaign, Illinois.

As with other migratory birds, it is extremely difficult to quantify the risk these proposed turbines may pose to Eagles. Perhaps the best approach is to maintain an awareness that numbers of both species are increasing so that at some point a consultation with the U.S. Fish & Wildlife Service may be prudent.

Nature Preserves. The wind energy facility will be easily visible from several dedicated Nature Preserves and a Land & Water Reserve, but will have no other effect on these protected lands, nor will they be obtrusive to visitors. The project area lies 6.6 miles from Raccoon Grove Nature Preserve and 6.8 miles from the Goodenow Grove Nature Preserve, both properties of the Forest Preserve District of Will County. The project area lies 6.5 miles from the Momence Wetlands Land & Water Reserve.

Consultation on the part of the Department is closed, unless Kankakee County desires additional information or advice related to this proposal. 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 modified; or additional species, essential habitats, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary.

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. Also, note that termination 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
Impact Assessment Section
Division of Ecosystems and Environment
keith.shank@illinois.gov
(217) 785-5500

cc: Prem Mehrotra, General Energy Corporation