



# Illinois Department of Natural Resources

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Pat Quinn, Governor  
Marc Miller, Director

March 29, 2011

Ms. Kristal Deininger, Zoning Administrator  
Community Development Department  
McKenzie Building  
11 S. 4th St., #400  
Pekin, IL 61554-4253

**RE: PNE Wind USA, Inc., White Tail Wind Farm, Tazewell County  
Endangered Species Consultation Program  
EcoCAT Review #1105872**

Dear Ms. Deininger:

The Department received this proposed action in Tazewell County from PNE Wind USA, Inc., to initiate consultation 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.

This document is being submitted to you to become a part of any administrative record associated with a decision by the County to authorize the proposed wind farm facility.

This letter states the biological opinions of the Department of Natural Resources pertaining to Natural Areas and those endangered or threatened species protected by the statutes, identified above, which require the County's consultation with the Department. The Attachment to this letter states the Department's opinions and recommendations pertaining to those species covered by the *Fish and Aquatic Life Code* [515 ILCS 5] and the *Illinois Wildlife Code* [520 ILCS 5].

PNE Wind USA has selected a location adjacent to the Illinois River Corridor, an area extremely rich in high-value natural resources. Within twenty miles of the project area can be found more than twenty-seven Sites listed on the Illinois Natural Areas Inventory (INAI), twenty-one locations designated by the Illinois Nature Preserves Commission, eight major conservation areas owned and managed by the Department of Natural Resources, and numerous sites used by thousands of migratory birds, including not less than eight nesting sites of the Bald Eagle.

**Indiana Bat, *Myotis sodalis***. Tazewell County lies within the range of the endangered Indiana Bat. As demonstrated by fatalities of Indiana Bats at an Indiana wind farm in 2009 and 2010, this species is vulnerable to collision with utility-scale wind turbines, especially during migration. The project footprint contains no known hibernation sites (mines or caves) for the Indiana Bat, a species listed as "endangered" by both the federal government and the State of

Illinois, although potential summer roosting habitat for the Indiana Bat is present in the vicinity of the project.

The Department possesses no records of the capture of any Indiana Bats in Tazewell County, but this should not be interpreted to mean this species is not present in the County. Summer colonies of the Indiana Bat have been documented at a number of locations in Western Illinois, especially in Adams and Pike Counties, while the Blackball Mine near LaSalle-Peru, 44 miles to the north, which provides a winter hibernation site, is designated by the Fish & Wildlife Service as “critical habitat” for this species.

Many Indiana Bats migrate significant distances, up to 300 miles, to their summer habitats. But many travel lesser distances, and some spend the summers in the vicinity of their winter roosts. It is not known whether individual Indiana Bats consistently use the same summer colony areas and the same winter caves, or if they consistently follow specific migratory routes.

Data from telemetry experiments with this species suggest they do not migrate in a straight line, although the characteristics of weather and terrain which may influence movements are not well-understood. Tazewell County lies near a line between the Blackball Mine and summer colony sites in Adams and Pike Counties; even if summer colonies do not exist in Tazewell County (which has not been established) it remains possible this species migrates through the County.

Despite the conventional wisdom that bats are found in and near forested habitat, this does not hold true during migration, so that wind energy projects located in very open landscapes retain the potential to kill hundreds of bats. Consequently, siting a wind energy facility in open agricultural areas does not obviate the need to monitor and assess the potential for bat mortality.

It has become standard practice in the Illinois wind energy industry for developers to perform pre-construction bat monitoring with acoustic detectors, both to assess over-all bat activity and to identify the presence of particular species. (Full-spectrum detectors enhance the probability of correctly identifying high-frequency-emitting bat species.) This method is most effective if at least some of the detectors are placed as near to the projected turbine nacelle elevation as possible. However, the failure to identify the calls of the Indiana Bat through this method cannot establish their absence from the vicinity. The Department is aware of at least one recent case in Illinois where numerous Indiana Bats were captured at a site where the deployment of multiple detectors failed to indicate their presence.

Based on existing information, it is the biological opinion of the Department the proposed action is likely to modify habitats of the Indiana Bat important in migration. Please see the Attachment for additional important information about non-listed bats.

*Recommendation #1. The Department recommends PNE Wind USA should conduct at least one full activity season (March-November) of pre-construction acoustic bat activity monitoring to assess or quantify the numbers of bats active within the project area, attempting to determine whether they include Indiana Bats.*

**Cerulean Warbler, *Dendroica cerulea***. The endangered Cerulean Warbler breeds in forests at the Mackinaw State Natural Area, less than three miles southeast of the project footprint. Cerulean Warblers are known to nest in many of the woodlands of the Illinois River's tributaries, but an assumption that migrants follow the River during migration is unwarranted.

The subject of several unsuccessful petitions for national listing to the Fish & Wildlife Service, the Cerulean Warbler requires large blocks of contiguous forest habitat for nesting and reproduction. A number of such habitats exist in the vicinity; several along Alloway Creek lie directly adjacent to the project area. Others exist west of the project area, along the corridors of Farm Creek and Ackerman Creek. The best habitats stretch along the Mackinaw River, with smaller blocks along its tributary, Walnut Creek, with better habitat appearing again at Metamora (Black Partridge Park Woods Land & Water Reserve).

Consequently, the project is nearly surrounded by blocks of habitat suitable for supporting breeding Cerulean Warblers. Most of these habitats lie on private property and have not been surveyed for breeding birds. Virtually no such habitat exists within the project footprint.

Small passerine migratory birds, like the Cerulean Warbler, are those most often killed by wind turbine collisions, which usually occur during migration, at night, and in foul weather. Resident breeding birds are much less likely to approach a wind turbine during daily activities. Foul weather can force migrating birds to lower altitudes than would otherwise be used, while low clouds and nearly complete cloud cover reduce the visibility of obstacles in their flight path.

Few measures exist to reduce avian casualties occurring during night migrations. Studies have shown that birds approaching collision lack the ability to perceive a turbine blade in motion, so that ultra-violet paints or color variations applied to blades are not effective in reducing mortality. Exhortations to avoid siting turbines in migratory pathways are unhelpful, since most such flyways exist only in the broadest and most general sense. Even "parking" turbine blades during periods of likely passage may not be effective, since some studies suggest birds in passing flocks take no evasive actions to avoid turbines, whether stationary or in motion.

It is the biological opinion of the Department that the proposed action is unlikely to adversely modify the essential habitat of the Cerulean Warbler, yet at least a moderate risk remains that one or more members of this species may be taken through collision with a turbine during the projected life of the facility's operation.

*Recommendation #2. The Department recommends pre-construction avian use surveys be expanded to include nearby large forest tracts to assess Cerulean Warbler population levels in the vicinity; this should provide a basis for a more refined evaluation of collision risks to this species. Post-construction mortality studies should be planned; the occurrence of a Cerulean Warbler death or those of numbers of warblers of any species may justify further action to avoid, minimize, or mitigate for future losses under the auspices of an Incidental Take Authorization from the Department.*

**Black-Billed Cuckoo, *Coccyzus erythrophthalmus***. A 2009 record for this species was established twelve miles east of the project area along the Mackinaw River in Woodford County.

Although the scientific literature suggests this species, too, is a denizen of large forest blocks, many current records in Illinois occur in forest edges or even in small clumps of trees. All agree nests tend to be built near the ground in shrubby undergrowth and small trees.

Although either form of habitat is rare to non-existent within the project footprint, the project area is virtually surrounded by suitable habitat for the Black-Billed Cuckoo. This species winters in South America, and so is another long-distance migratory bird whose most likely interaction with a wind turbine may occur during migration rather than while foraging.

*Recommendation #3. The Department recommends pre-construction avian use surveys be expanded to include nearby forest tracts to assess Black-Billed Cuckoo population levels in the vicinity; this should provide a basis for a more refined evaluation of collision risks to this species. Post-construction mortality studies should be planned; the occurrence of a Black-Billed Cuckoo death may justify further action to avoid, minimize, or mitigate for future losses under the auspices of an Incidental Take Authorization from the Department.*

**Loggerhead Shrike, *Lanius ludovicianus***. The State-listed threatened Loggerhead Shrike is adapted to the savanna conditions of interspersed grasslands, shrubs, and trees. This species has been adversely affected by the decline in animal husbandry and the abandonment of the "shelter-belt" fence-row conservation practice, which has severely reduced both breeding and foraging habitat. The Shrike, also known as the "butcher bird," needs thorny trees and shrubs, even barbed wire, on which to impale its prey, which may be left for several days before being eaten. Areas which support large insects and small rodents, major food items, are also necessary. Due to losses of suitable habitat, Loggerhead Shrikes may attempt reproduction in trees near homesteads, in cemeteries, and in other areas where they would normally not be expected.

The Shrike has been documented from two nearby locations in both Tazewell and Woodford Counties, at distances of 12 and 8 miles, respectively. They may make use of forest margins if an adequate hunting territory is associated with them. Although suitable habitat is abundant in the vicinity, only small patches of potentially suitable habitat are present within the actual footprint. The species also has a statewide distribution so that migrants, as well as resident birds, may occur in the area.

Apart from migratory collisions, the main risk for wind energy facilities is thought to be the potential for further loss of remaining habitat, if trees are cleared to avoid wind turbulence or to improve turbine exposure, or if road-side trees are cleared to create turning radii for turbine carriers, or to establish power lines. Should such activities occur during the breeding season, the potential may exist for prohibited "taking" of nesting Shrikes. This species' sensitivity to tall structures, visible motion, noise, shadow-flicker, and other turbine effects has not been studied, but these effects may have the potential to displace this species from otherwise suitable habitat.

Based on existing information, it is the biological opinion of the Department the proposed action is unlikely to adversely modify the essential habitat of the Loggerhead Shrike. The results of pre-construction avian surveys may alter this opinion.

**Upland Sandpiper, *Bartramia longicauda*.** This species has been recorded from a stubble field near Minonk in Woodford County. Although formerly regarded as a grassland bird, in recent years the species has often been documented nesting in grassed waterways and in no-till corn and soybean fields. The absence of large grassland blocks does not guarantee the absence of this species.

The Upland Sandpiper arrives in North American breeding areas in late April and May and departs again by mid-August. Brooding occurs in late May and June, with juveniles able to fly by late July.

While this species is not noted for its sensitivity to vertical structures, it may be displaced from essential habitat due to the near presence of turbines, or the flickering shadows they cast. If turbines are built when the birds are absent, it is possible the birds will find these habitats unsuitable when they return. However, in one Illinois location, Upland Sandpipers have been reported to persist in nesting at the same location within a wind farm for three consecutive years following construction, which suggests they may tolerate turbines if available habitat is limited, although the specific attributes of the relationship between this nesting site and the nearby turbines are not known.

This species may be at risk of blade-strike mortality, since the mating ritual includes acrobatic aerial displays which occur through the elevations of blade rotation. The construction of access roads, land-lines, substations, and turbines during the mating and rearing season has the potential to "take" this species through the inadvertent destruction of nests and the unintentional harassment of adults, which may more often resort to "distress" behaviors (the well-known "broken wing" decoy defense) to protect their nesting sites.

These birds may also be subjected to increased predation pressure since there is evidence that meso-predators, including coyotes, quickly learn to scavenge beneath wind turbines for the carcasses of birds and bats killed by collisions. Habitual scavenging is likely to increase the opportunities for discovering nests and killing Sandpiper chicks and adults.

Unless the Upland Sandpiper is identified through pre-construction avian use surveys, it is the biological opinion of the Department the proposed action is unlikely to adversely affect the essential habitat of this species.

**Mackinaw River Illinois Natural Areas Inventory (INAI) Site.** From its confluence with Alloway Creek in Tazewell County, a mere 1.5 miles south of the project, to its source in Ford County, the Mackinaw River has been designated an INAI Site for its high-quality aquatic natural communities, its high fish and mussel diversity, and its provision of essential habitat for several State-listed endangered or threatened species. The INAI designation also includes three of its tributaries: Walnut Creek, Panther Creek, and Henline Creek. All but the northwestern portion of the project area lies in the Mackinaw River watershed. Consequently, disturbances

associated with construction and operation of the project have the potential to adversely modify the INAI site.

Walnut Creek rises near Metamora, running east and south through Eureka before joining the Mackinaw east of Goodfield. Alloway Creek drains the southeastern portion of the project area, while Deer Creek, which drains the central project area, joins the Mackinaw downstream of the point where the INAI designation begins. The latter relationship is not insignificant, however, since it provides an avenue for State-listed species in the Mackinaw to establish a presence in the project area.

Among the notable species present in the Mackinaw River watershed are the **Slippershell Mussel**, *Alasmidonta viridis*, which occupies small headwater streams; the **Spike Mussel**, *Elliptio dilatata*, most often found in medium to large streams; the **Mudpuppy Salamander**, *Necturus maculosus*, which spawns in headwater streams in the late autumn but spends most of its time downstream in larger segments and quiet backwaters; and the **Lake Sturgeon**, *Acipenser fulvescens*, whose smaller individuals and juveniles can penetrate some distance up the larger tributaries.

None of these species have been documented from points in Deer Creek, Alloway Creek, or Walnut Creek. But habitats are suitable; the Salamander is quite mobile; mussels are capable of establishing new populations due to their parasitic relationship with fish during their reproductive stages; and fish can move easily until barriers to passage are encountered. No work in any tributary of these streams should be done without first surveying aquatic fauna for at least 100 meters upstream and downstream. Unintended spills of fuels or other chemicals have obvious implications for downstream communities. The Mudpuppy, in particular, may be sensitive to electro-magnetic fields associated with underground power lines which pass beneath stream channels.

At least one pair of Bald Eagles have established a nest on the Mackinaw River (please see Attachment), and migrating Ospreys have been noted in McLean County, so the River may play a significant role in foraging and migratory movements of these and other large raptors which may be pertinent to operation of the wind energy facility.

*Recommendation #4. Particular care should be taken to avoid disruption of agricultural drain tiles or to effect their prompt repair if damaged, because many aquatic fauna thrive best in cooler waters and drain tiles are an important influence on the thermal regimes of receiving streams. The Mudpuppy, in particular, can be injured or killed by water temperatures in excess of 72 degrees Fahrenheit.*

*Recommendation #5. Any in-stream work--to lay power lines or to replace or improve bridges and culverts to transport turbine components--should be preceded by surveys of aquatic fauna for 100 meters in both directions to avoid prohibited incidental taking of endangered or threatened species which may be present.*

*Recommendation #6. Rigorous compliance with NPDES requirements should be implemented and enforced to minimize sedimentation and siltation of downstream habitats.*

**Mehl's Bluff Nature Preserve and INAI Site; Parklands Nature Preserve and INAI Site.**

The Parklands INAI Site comprises a portion of IDNR's **Mackinaw River State Natural Area**. The State-owned portion includes the 41-acre **Parklands Nature Preserve**, while the adjacent privately-owned 27-acre portion of the INAI Site is dedicated as the **Mehl's Bluff Nature Preserve**. Although the Mackinaw SNA lies only a mile from the project site, Mehl's Bluff lies 2.25 miles from the project, on the south side of the Mackinaw River.

Although Mehl's Bluff contains elevations equivalent to those within the nearest portion of the project area, the Nature Preserve is entirely wooded, so that no wind turbines will be visible from within the Preserve. This is also true of the Parklands Nature Preserve. However, turbines will be visible from the western boundary of the Parklands INAI Site, which is the woodland margin. Each of these areas may experience some level of intermittent illumination at night due to the FAA requirements for aircraft warning signals, especially so with a low cloud ceiling, which will reflect such illumination downward. This illumination may have some effects on inter-relationships among nocturnal species and their habitats.

*Recommendation #7. Consideration should be given to the use of an FAA-approved Audio-Visual Warning System (AVWS) which allows warning lights to remain off unless an aircraft is on a collision course with a turbine.*

**Log Cabin Hill Prairie INAI Site/Coon Hill Prairie Natural Heritage Landmark.** These Sites are located just less than three miles south of the project footprint, and less than a mile north of the village of Mackinaw. However, the slope orientation of the hill prairie is to the southwest, overlooking the Mackinaw River floodplain. The wind farm will be screened from view from within the INAI Site by forests to the north, despite a rising landscape. The Department anticipates no adverse effects to this Site. On overcast nights, the Site may receive intermittent illumination from the FAA warning lights of the project, but the extent this may alter conditions for nocturnal wildlife at the Site, and its significance, is unknown. It is the biological opinion of the Department the project is unlikely to adversely affect the Log Cabin INAI Site/Coon Hill Prairie Natural Heritage Landmark.

**Caterpillar Hill Prairies Natural Heritage Landmark and INAI Site.** Five miles northwest of the project, on the far side of the City of Washington, these hill prairies are located on the bluffs above Ten Mile Creek. The wind farm will not be visible from the hill prairies due to surrounding forest vegetation. On overcast nights, the Landmarks may receive a low-level of intermittent illumination from the FAA warning lights of the project, but the degree to which this occurs will be ameliorated or offset by the sky-glow from Washington, Peoria, and other nearby urban areas. It is the biological opinion of the Department the project is unlikely to adversely affect the Caterpillar Hill Prairies Natural Heritage Landmark and INAI Site.

**Black Partridge Park Woods Land & Water Reserve and INAI Site.** This large Land & Water Reserve northwest of Metamora is about six miles north of the project area. Few, if any, turbines in the project may be visible from the Reserve due to screening by adjacent woodlands. Black Partridge Park Woods does provide interior forest habitat for migratory birds, such as the Black-billed Cuckoo and Cerulean Warbler (although no records for these species have been

established there). On overcast nights, the Reserve may receive a low-level of intermittent illumination from the FAA warning lights of the project, but the extent this may alter conditions for nocturnal wildlife in the Reserve, and its significance, is unknown.

It is the biological opinion of the Department the project is unlikely to adversely affect the Black Partridge Park Woods Land & Water Reserve and INAI Site.

**Please review the Attachment for additional important information.** Consultation on the part of the Department is terminated, unless the County desires additional information or advice related to this proposal. In accordance with 17 Ill. Adm. Code 1075.40(h), Tazewell County must notify the Department of its decision regarding these recommendations, whether it will:

- Allow the action to proceed 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; the proposed action is modified; or additional species, essential habitat, 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 reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal, 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  
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Division of Ecosystems and Environment  
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cc: Jenny Skufca, Illinois Nature Preserves Commission  
Vince Green, PNE Wind USA, Inc.  
Jim Valleroy, Terracon, Inc.

Attachment

## ATTACHMENT

### PNE White Tail Wind Farm Tazewell County

Pursuant to the Department's authority to conserve and to protect the fauna and flora of Illinois, the following information is provided about possible impacts to non-listed species and important conservation resources that are or may be found in the area. In certain instances it also provides recommendations for the consideration of the County and the developer.

**Avian Wildlife.** The construction of large-scale wind farms has implications for a broad range of wildlife; it may result in increased mortality, fragmentation of essential habitats, and displacement of important life-cycle activities, such as feeding and nesting. To assess the effects of such facilities, it is imperative to establish a base-line of wildlife presence and activity within and near the proposed facility to which later conditions may be compared in order to discern how they may have been affected by the wind farm or other human modifications of the area. The nearby presence of a federal wildlife refuge and the Illinois River flyway renders baseline observations even more important than is usual.

*Recommendation #A1. The Department recommends pre- and post-construction assessments of avian usage within the project area. Consideration of all seasons should be included, but particularly migratory seasons. Such studies should include mapping of habitats within and adjacent to the project footprint, and consideration should be given to periodic repetition of such studies during the life of the project to detect/monitor significant shifts in wildlife usage. Foraging by waterfowl based along the Illinois River may be of particular importance.*

**Bats.** Although the Indiana Bat is currently the only federally-listed or state-listed bat believed to occur in or near Tazewell County, other bat species are abundant in the area. IDNR considers the cumulative risk to species. The high bat mortality that can be found at some wind farms, coupled with the westward movement of White-Nose Syndrome, suggests increasing threats to bat species in Illinois. WNS was not detected in any Illinois hibernaculum in the winter of 2010/2011.

In anticipation of the arrival of White Nose Syndrome (WNS), Wisconsin recently listed four additional species of bats, all of which are present in Tazewell County. Newly-listed by Wisconsin are: the **Northern Long-Eared Bat** (*Myotis septentrionalis*), the **Little Brown Bat** (*Myotis lucifugus*), the **Big Brown Bat** (*Eptesicus fuscus*), and the **Tricolor Bat** (*Perimyotis subflavus*), formerly known as the **Eastern Pipistrelle**. These species may be at similar risk in Illinois in the future, so bat studies should take careful note of their locations and abundance.

*Recommendation #A2. The Department recommends the applicant perform at least one fall migration season (July-October) of acoustic bat monitoring to assess the level of bat activity within and through the project footprint, if possible at ground level and nacelle-height. The Department recommends consideration of a requirement to periodically repeat, perhaps on a five-year cycle, monitoring activities in order to detect significant shifts in bat species or abundance. The use of full-spectrum acoustic equipment offers an improved opportunity to*

*identify the species of bats present without also conducting mist-net sampling. If acoustic monitoring indicates a high level of bat activity, further assessment is appropriate, including mist-net studies and telemetry studies to confirm species identification and roosting locations. At a minimum, high levels of pre-construction bat activity should prompt post-construction mortality studies.*

*Recommendation #A3. Operational curtailment is one method demonstrated to consistently and significantly reduce bat mortality at wind farms while minimizing losses in power production. Curtailment consists of adjusting the operational “cut-in” wind speed at which wind turbines initiate rotation. If bat activity in the area is high, PNE may wish to consider implementing a curtailment policy to minimize bat mortality.*

**Aviation Warning Lights.** Turbines more than 200 feet high are required by the Federal Aviation Administration to have flashing warning lights to warn aviators of potential collision hazards. Usually, flashing red lights are used, which most researchers agree are less likely to attract night-flying migratory birds than are flashing white lights or steady red lights. This does not eliminate collision risk caused by lighting, however.

The light flashes are typically synchronized across a wind energy facility, so that all lit turbines flash together. In overcast conditions, red light is reflected from the cloud deck back to the ground. This may have the effect of altering the behavior of nocturnal terrestrial wildlife, whose visual organs are typically adapted to low light or spectra in the infrared or ultraviolet ranges. Flashing illumination may affect the balance between predators and prey, by either enhancing or interfering with the ability to detect prey or predators.

It is the biological opinion of the Department the proposed action is likely to result in nocturnal migrant bird mortality and to adversely affect nocturnal terrestrial wildlife due to intermittent illumination from aircraft warning lights.

*Recommendation #A4. To minimize the adverse effects of intermittent illumination, a wind farm may be equipped with an FAA-approved Audio-Visual Warning System (AVWS) so that warning lights operate ONLY when approaching aircraft are at risk of collision with a wind turbine, and remain off under other circumstances.*

**Bald Eagle, *Haliaeetus leucocephalus*.** Although de-listed by both the federal and Illinois governments, this species remains protected by two federal laws, the *Migratory Bird Treaty Act* and the *Bald and Golden Eagle Protection Act*. Illinois has been experiencing a strong population increase, suggesting that Eagles will be occupying much new territory. Large numbers of Bald Eagles are present along the Illinois River and its tributaries.

The Department is aware of no fewer than eight Bald Eagle nest locations within 20 miles of the PNE project footprint. A nest on the Mackinaw River three miles northeast of Congerville is approximately nine miles from the footprint and is the closest known nest; the other seven lie along the Illinois River. (Draft Eagle Conservation Guidelines, recently released by the Fish & Wildlife Service, suggest that Eagle activity areas within ten miles of a wind farm warrant an assessment and coordination with the Service.) Potential Eagle nesting habitat is present along

the entire length of the lower Mackinaw River, much of it within just a few miles of the wind farm.

The Department is aware of a case in Ontario of a juvenile Bald Eagle colliding with a wind turbine, and a second Bald Eagle mortality has been reported from Wyoming. Juvenile birds, which may venture as far as ten miles from the aerie, may be more vulnerable to collision, and it is also possible that construction of wind turbines may affect the selection of new nesting sites or the use of existing nests. Bald Eagles typically forage over streams, lakes, and ponds. Eagles are not limited to river corridors during migratory flights. Numbers of Eagles die each year due to collisions with vehicles as they feed on road-kill carrion.

It is the biological opinion of the Department the project may jeopardize individual Bald Eagles which may enter the project's airspace. If avian studies indicate use of the project's airspace by Bald Eagles, the applicant should consider discussing the matter with the U. S. Fish & Wildlife Service.

**Osprey, *Pandion haliaetus*.** This species has the distinction of being the only State-listed endangered or threatened bird known to have been "taken" during an interaction with a wind turbine. In late September 2007, a juvenile Osprey migrating south through McLean County was injured by a wind turbine. Researchers conducting bat mortality monitoring found the injured bird, which was taken to a veterinarian, who determined that one wing was simply dislocated. The joint was re-set and the bird was successfully released the following day.

Most likely this bird was roosting or attempting to roost on the nacelle when the injury occurred. Most Ospreys hatched in Illinois are reared in nests built on manmade platforms, a fact which may have induced the bird to attempt to perch on the nacelle.

Another aspect of interest from this incident is the fact it took place in McLean County, many miles from the nearest documented breeding site for the Osprey. Subsequently, an Osprey was observed during the spring migration at a second McLean County wind farm located less than ten miles east of the PNE project footprint.

The knowledge that Ospreys breed on the Illinois River and migrate to locations on the Gulf of Mexico and South Atlantic Coast suggests it is possible Ospreys will pass in close proximity to the proposed wind farm.

It is the biological opinion of the Department the proposed action is unlikely to adversely affect the Osprey, but avian studies should pay particular note to any observations of this species, since unexpected collisions are possible.

**Mudpuppy, *Necturus maculosus***. The Mudpuppy, listed as threatened in 2009, has been documented from the Mackinaw River INAI Site in McLean County. The species is migratory in riverine systems, seeking shallow headwaters for spawning in November but occupying cooler and deeper pools downstream in summer. Consequently the Mudpuppy may be present for at least part of the year in the streams and drainage ditches within the project footprint.

The Mudpuppy is the only known glochidial host of the State-listed endangered **Salamander Mussel, *Simpsonaias ambigua***, a species which is now being evaluated for federal listing under the federal *Endangered Species Act*; the decline of the Mudpuppy may be a major factor in the disappearance of the Salamander Mussel.

The Mudpuppy never develops beyond an aquatic larval stage, and so is never found in terrestrial habitats. It inhabits clear rivers, creeks, streams, lakes, and ponds, but conceals itself under rocks or woody debris during the day, feeding actively at night. It typically goes unseen except by fishermen, who sometimes inadvertently catch it. It can cope with siltation and sedimentation so long as clear gravelly headwater areas remain available for reproduction.

Cool or cold water is essential for this species, which remains active all winter; water temperatures above 72°F are harmful, and those above 77°F can be fatal. Agricultural tile drainage helps lower stream temperatures, but the removal of riparian trees and shrubs exposes streams to direct solar radiation and heating. In-stream cover provided by rocks and woody debris is essential for concealment and reproduction, since eggs are suspended from the bottoms of rocks and logs. The common belief that removal of woody debris from stream channels improves drainage is a factor in the decline of this species.

Major threats include pollution, siltation and sedimentation, stream channelization, and woody debris removal. The main risks associated with wind energy projects will be direct stream modification through the repair or upgrade of roads, modification of aquatic thermal regimes through the disruption of agricultural tile drainage systems (which should be promptly repaired, and siltation and sedimentation associated with construction and permanent features, such as service roads, which suppresses prey populations and renders spawning areas unsuitable. Any planned in-stream work may require an Incidental Take Authorization if the Mudpuppy is present.

The Mudpuppy, lacking the swim bladder of a fish, cannot be collected through electro-shocking methods. The use of baited fish traps may be the most appropriate surveying method, but care must be taken that the use of such traps does not result in the drowning of turtles.

*Recommendation #A5. The Department recommends that any in-stream work in headwater tributaries either be preceded by fauna surveys or be scheduled for late summer to minimize the potential risk to this species.*

**Mackinaw River State Natural Area.** This 1,420-acre IDNR property is located just over a mile south-southeast of the project area, on both sides of the Mackinaw River, but with the major portion south of the River. As noted earlier, the Mackinaw River SNA contains the Parklands INAI Site, which in turn contains both the Parklands Nature Preserve and the Mehl's Bluff Nature Preserve.

The eastern portion of the SNA is heavily forested, supporting area-sensitive forest breeding birds such as the State-listed endangered Cerulean Warbler. The western portions of the SNA consist of open fields, and it is likely, despite differences in elevation, that wind turbines in the proposed project will be visible from much of the western portion of the SNA during the day, and the project will definitely be visible at night when FAA aviation warning lights are operating, which will compromise "dark-sky" values at the SNA. Whether the intermittent illumination from the project at night may alter the behavior or relationships between and among nocturnal wildlife in the SNA is likely, but its significance is unknown.

*Recommendation #A6. Consideration should be given to the use of an FAA-approved Audio-Visual Warning System (AVWS) which allows warning lights to remain off unless an aircraft is on a collision course with a turbine to alleviate potential impacts to site users and wildlife.*

**Woodford County State Fish & Wildlife Area.** This 3,600-acre IDNR managed area lies on and along the Illinois River near Chillicothe. It supports major concentrations of tens of thousands of migratory waterfowl each fall, winter, and spring, many of which, especially several species of geese, are dependent on agricultural fields in the surrounding area for adequate food. Geese are well-known to use fields as far as 20 miles from their holding areas, while the Woodford SFWA lies only 12 miles from the project area.

**Pekin Lake State Fish & Wildlife Area.** This 1,500-acre IDNR managed area, as its name suggests, is located along the Illinois River north of Pekin. It contains the **Worley Lake INAI Site**, which supports a major waterfowl rookery, including nesting by the State-listed endangered **Black-Crowned Night-Heron**, *Nycticorax nycticorax*. It also supports at least one nesting pair of Bald Eagles. Pekin Lake SFWA lies 12 miles west of the project area, well-within the foraging radius of migratory waterfowl.

**Powerton Lake State Fish & Wildlife Area.** This 1,500-acre IDNR-managed cooling lake is located about 16 miles west-southwest of the project area. Its warm waters attract many thousands of over-wintering waterfowl, while three separate nesting locations for the Bald Eagle can be found on its margins.

*Recommendation #A7. The presence of three major wildlife refuges in the vicinity suggests the proposed wind farm lies within an important winter feeding area for migratory waterfowl. Consequently, avian use surveys should include winter observations of waterfowl usage of the project area.*