

**Addendum II to the Phase I Avian Risk Assessment for the Flat Rock Wind
Power Project, Lewis County, New York: Phase One and Phase Two**

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This addendum is a followup to the March 31, 2003, addendum report (Kerlinger 2003) to the original Phase I avian risk assessment for the Flat Rock Wind Power Project (Kerlinger 2002). It includes an assessment of risk to birds in the Phase II area (see Figure 1 of the first addendum – Kerlinger 2003) that was based on a site visit to the Flat Rock Phase I and Phase II areas on June 20-22, 2003. There are also references to a breeding bird study conducted by Kerlinger and Dowdell during late June and early July 2003.

During the site visit all roads in the Phase II project area were driven and habitat within several hundred meters of those roads examined. Some roads were also walked. In addition, some roads within the Phase I area were driven, after being originally visited during the initial avian risk assessment in 2000. The methodology used was similar to that described in the Phase I avian risk assessment (Kerlinger 2002).

The habitats examined for the Flat Rock Phase II area were, for the most part, similar or comparable to those examined in the Flat Rock Phase I area. They were a mixture of hay fields, old fields, brushy areas, forest edge and forest patches, some wetlands, residential areas, and farmsteads. Within the Phase II boundary there were three areas that differed in habitat from the Phase I project area. Most obvious was the interior forest habitat along Rowsam Road in the south—central, western border of the project site. Rowsam Road (between Rector and Flat Rock Roads) extends through a dense, unfragmented forest. The southernmost portion of the Phase II area (south of Flat Rock Road) was different in that there was more forest and less open farmland (hay and corn). Finally, the northwest corner of the Phase II area was also characterized by less farmland and more brush and forest, along with isolated wetlands. A more thorough description of each of these areas follows.

Southern Extension Area (Keener Road, Centerville Road, Maple Ridge, French, and Graves Roads). – The areas south of Flat Rock Road tend to be more forested and have open, farm fields that are very small when compared to those along Flat Rock Road, Rector Road, Porter Road, and other portions of the Phase I area. The forests are highly fragmented. Turbines would likely be located within the small farmed fields (hay and corn – plowed) or within 100 m of those fields within the forested patches. These habitats are not sensitive and they are not likely to support sensitive or rare species, although 2 Horned Larks (New York State Species of Concern) were seen within this area. The grassy fields along Keener Hill Road are the largest hay fields in this area and they do support some Bobolinks, Savannah Sparrows, and other grassland birds. The largest hayfields are along Keener Road. Those fields along Graves, French, Centerville and Maple Ridge are relatively small, irregularly shaped, and surrounded by forests. Some are also recently abandoned and succeeding to brushland. The entire area is a more fine-grained mosaic than the more actively farmed habitats in the Phase I project area.

Centerville Road becomes more wooded as it extends to the west, although the forests are fragmented. These forests are actually patches or fingers/peninsulas of trees and shrubs. There is an apple orchard, a conifer/Christmas tree plantation, and brushy fields that were once hay or cornfields. The roadside forests and edges have maple, black cherry, trembling aspen, nannyberry viburnum, arrowwood viburnum, maple-leaf viburnum, red-osier dogwood, as well as aspen and other trees and shrubs. There are some small hay fields, but they are not good

grassland bird habitat because of their small size and because they are reverting in many cases to brushland. There is also evidence of logging within this area.

Because this area does not contain sensitive habitat and because the types of birds that nest within this area are almost exclusively common birds, collision and habitat disturbance/displacement risks from the construction of a wind project are not likely to be biologically significant.

Rowsam Road – Rowsam Road is in the southwest-central part of the Flat Rock project area and extends farther to the west than the original Phase I project boundary. It is clearly different from any of the habitats within the Phase I project area. The habitat along Rowsam Road is the only interior forest habitat (Figure 2) within the Flat Rock Wind Power Project area. The forest is near the edge of the large, contiguous forest that is part of the Tug Hill Wildlife Management Area and the State Forest Preserve. Together these holdings comprise a very large, contiguous forest that is very high quality nesting habitat for neotropical migrant and other birds species. The habitat along Rowsam Road, although not mature forest, is a spruce-hardwood mixed forest of middle age and height. The canopy does not exceed about 40-50 feet in most places, but the subcanopy and brush layer is very thick. Indeed, it is nearly impenetrable in places. Canopy trees include red spruce, sugar maple, black cherry, and others. There are a few cabins, some dilapidated and in disrepair, that may not be in use. Some are active camps. The openings in the forest are small and the canopy overarches much of Rowsam Road. There are likely to be low-lying forested wetland pockets that provide excellent habitat for some forest nesting species of birds.

The habitat along Rowsam Road, particularly west of the road, is likely to be the most sensitive habitat within the entire project area (Phase I and Phase II). Widening of the road (opening the canopy) and construction of new roads into the turbines, along with creating openings in the forest would fragment this forest, thereby creating edge situations within the forests of the relatively contiguous State Forest Preserve and Tug Hill Wildlife Management Area. These areas are buffered by tracts like that along Rowsam Road and the fragmented forests that extend farther to the east. Opening the forests to the west of Rowsam Road would isolate those forests that are to the east, making them less suitable for nesting neotropical migrant songbirds. Within the entire Phase I and Phase II area, development of Rowsam Road forests would, potentially have the greatest impact to birds.

During the site visit Hermit Thrush and Swainson's Thrush were heard along Rowsam Road, along with Ovenbird and other species of forest interior nesting birds (neotropical migrants). These species are mostly lacking throughout the Flat Rock project area and the Rowsam Road habitats seem to be the best within the project for these species. The nesting bird survey conducted by Kerlinger and Dowdell (2003) confirmed the presence of interior forest nesting species and the difference between the avifauna that nests near Rowsam Road as opposed to the rest of the project site.

Northwest Portion of Phase II Area (Sweet, North, Widener, and Cobb Roads). The habitats in this portion of the Phase II project area, especially those along Sweet, North, Widener, and Cobb

Roads are more forested and there is less farmland than the areas within the Phase I boundary (particularly those along Porter, Flat Rock, O'Brien, and Rector Roads). There is more brushland/forest patches and low-lying brushy wetlands in the northwest portion of the project site. This is true particularly at the southern end of North Road (south of Widener Road) where the road is bordered by semi-forested wetlands. The farm fields in this area also seem to be smaller than those in the Phase I area, although the fields along Widener Road (near the junction with North Road) are wide open hay and corn fields. The tree and shrub species are similar or the same as those found during the original avian risk assessment for the Phase I area (Kerlinger 2002), but coverage by brush and forest species is greater within the northwest portion of Phase II as opposed to the Phase I area. There are many wetlands in this area, which need mapping.

It is almost certain that the avian community in this part of the project area is different from that found in the Phase I portion of the project. Although the same species are represented, there are likely to be fewer grassland birds (lower abundance) and more brush and forest edge species. In addition, there are also likely to be more individuals of species that nest in brushy wetlands as opposed to grassland areas. Grassland species are present, but their densities are not likely to be as high because the habit is not as suitable as the areas along Flat Rock, Rector, Gardner, and some other roads within the Phase I boundary.

The placement of turbines in this area is not likely to result in biologically significant numbers of collision fatalities. There is likely to be some displacement of nesting birds, including some grassland birds. Because the area contains little in the way of sensitive habitat and because the types of birds that nest within this area are almost exclusively common birds, risks from the construction of a wind project are not likely to be biologically significant.

Birds Observed. Species observed in the Phase II area during the June 20-June 23, 2003 site visit included: Great Blue Heron, Turkey Vulture, Northern Harrier, Red-tailed Hawk, American Kestrel, Ring-billed Gull, Killdeer, Ruffed Grouse, Wild Turkey, Northern Flicker, Downy Woodpecker, Mourning Dove, Chimney Swift, American Crow, Barn Swallow, Tree Swallow, American Robin, Hermit Thrush, Eastern Bluebird, Eastern Kingbird, Eastern Phoebe, Horned Lark, Cedar Waxwing, Gray Catbird, Red-eyed Vireo, Blue-headed Vireo, Chestnut-sided Warbler, Yellow Warbler, Ovenbird, Common Yellowthroat, Chipping Sparrow, White-throated Sparrow, Vesper Sparrow, Savannah Sparrow, Song Sparrow, Indigo Bunting, Rose-breasted Grosbeak, Red-winged Blackbird, Common Grackle, Eastern Meadowlark, Bobolink, American Goldfinch, and House Sparrow. Of these species, Northern Harrier is listed as Threatened by the New York State Department of Environmental Conservation, and Horned Lark and Vesper Sparrow are listed as species of concern.

Migrating Birds. The habitats examined for the Phase II project were not suggestive of important habitat for migrating songbirds, waterbirds, raptors, shorebirds, or other species. In other words there are no ecological The habitat is relatively common in the general region and it did not appear to be attractive to large numbers of migrating birds. The original assessments of risk to migrants in the Phase I report and addendum to that report remain the same. That original assessment was based on habitat present, the literature, and a previous radar study conducted at the project (Cooper and Mabee 1995).

Wintering Birds. The habitats examined did not change conclusions presented in the Phase I avian risk assessment. The habitats within the boundaries of the Flat Rock project, both Phase I and Phase II areas, support relatively few wintering birds. For this reason, risk to wintering birds is not likely to be biologically significant.

Additional Information on Avian Collisions with Wind Turbines. Since the first addendum to the Phase I Avian Risk Assessment for Flat Rock was written, additional information has become available with respect to collision impacts at wind turbines. A study at the Stateline Wind Power Project in Washington and Oregon revealed relatively few fatalities at the nearly 400 turbines at that location. The overall fatality rate of birds per turbine per year during an 18 month study (Erickson et al. 2002) was estimated to be 1.686. Despite moderately high raptor use, the rate of raptor fatalities was 0.05 per turbine per year. Few night migrating songbirds were found, although many turbines were lit. A conclusion that is now circulating is that because there have been no large-scale mortality events at wind turbines, it is unlikely that the red strobes now generally required by FAA for wind turbines are unlikely to attract night migrating birds. It is important to note that migrants account for a varying proportion of fatalities but are generally less than about 50-75% of all birds that collide with wind turbines. These numbers are far lower than the numbers reported from tall, multiply lit, guyed communication towers. (Furthermore, recent studies are confirming that unguyed communication towers less than about 500-600 feet in height rarely, if ever, are involved in collisions of any types of birds.)

Current Development Pressure and Habitat Future. During the site visit, habitat changes were noticed since the original site visit in summer 2000. Most importantly, the habitats within the Phase I and Phase II areas are faced with development pressure that could easily cause severe impact and disturbance in the next decade or two. The presence of new homes, as was evident toward the southern terminus of the project area. New Niagara Mohawk distribution lines also suggested that camps, previously without electricity, will soon be electrified. This and other signs of new homes, snowmobile camps, and other development suggests that the farmland and forests will be further fragmented in the coming years. These types of development could easily eliminate many species of birds that now depend on grassland habitats because those habitats will either be developed or revert to brushland and forest. The new forests will not likely be contiguous forest, so the avian species that will benefit from farmland subdivision and habitat fragmentation will be the most common species such as those that prefer forest edge and brushland. This has been the trend in other areas of New York State and elsewhere. The risk of subdivision and home development should be weighed against the risk from wind power development.

Conclusions and Risk. Although collision impacts to birds nesting and foraging in the Phase II area are not likely to be greater than for the Phase I area, the greater number of turbines will probably cumulatively increase the numbers of fatalities in proportion to the additional numbers of turbines. The overall numbers of fatalities, however, are not likely to be biologically significant. Disturbance and displacement risk to birds in the Phase II area is also likely to be similar to that of the Phase I area, and the degree of impact will likely be proportional to the footprint area of the project. For most species and areas, this is not likely to be biologically

significant. However, the forested area along Rowsam Road are likely to experience a greater degree of impact because the forests are currently contiguous and development will result in fragmentation. This will likely impact neotropical migrant songbirds that nest there. The additional impacts to grassland-hayfields from turbines will also be proportional to the size of the developed area. Grassland birds have been shown to avoid turbines (Leddy et al. 1999), but habituation has never been studied for these birds. Whereas it is obvious that some species habituate to the presence of structures, including wind turbines, it is not known if grassland birds will habituate to these structures and if they do, to what degree that habituation will be. Studies are needed to determine the degree of impacts in fields similar to those at the Flat Rock project and whether grassland birds such as Bobolinks and Savannah Sparrows habituate to the presence of turbines.

Literature Cited

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Appendix I. Addressing the U. S. Fish and Wildlife Service Draft Interim Guidelines for wind power development for the Flat Rock Wind Power Project.

This appendix is written in response to the recent issuance of the U. S. Fish and Wildlife Service's interim, voluntary guidelines for siting and developing wind power facilities. Those guidelines appeared in public in the Federal Register, during the first one-half of July, 2003, and the U. S. Fish and Wildlife Service gave the first briefing on the new guidelines to the National Wind Coordinating Committee on July 29, 2003. It should further be stated that the guidelines are interim and voluntary, and that the Federal Register has opened the comment period, which will last for 2 years. Comments on those guidelines from various organizations, companies, and industry associations are now being prepared.

The following bullets detail how this report and the original Phase I avian risk assessment (Kerlinger 2002) and a previous addendum have either conformed to those guidelines or how the guidelines are not consistent with available science.

Because the Service guidelines appeared after virtually all of the avian risk assessment work was conducted, it was not possible to adhere to all the guidelines. However, the standard Phase I Avian Risk Assessment process and additional work done for this project incorporates many of the guidelines and recommendations made by the Service.

Conformance to Guidelines – Specifics

Teaming With Agencies. Letters were written to state (New York Department of Environmental Conservation - Albany) and federal (U. S. Fish and Wildlife Service - Ecological Services office in Cortland) wildlife agencies in 2000 (Phase I of the Flat Rock project) and again in 2003 (Phase II) requesting information on listed species and species of special concern, as well as concern regarding other bird species. Letters from these agencies were received in June 2000 signed by David Stillwell, U. S. Fish and Wildlife Service, and Teresa Mackey, New York Natural Heritage Program, NYS DEC. A second set of letters from these agencies were received in March 2003 (signed by Stillwell and by Charlene Houla NYS DEC). In addition, Mike Stoll, a biologist at the Cortland Office of U. S. Fish and Wildlife Service was contacted and asked for information regarding birds at the project site as well as concerns of the Service with respect to the project. New York State DEC biologists were also queried (Jim Farquar – regional biologist; Kim Hunsinger, NY State Breeding Bird Atlas coordinator; Dennis Faulkham – regional biologist; Robert Miller, NYS DEC Partners in Flight Coordinator; and Peter Nye – Chief of Endangered and Nongame Species Unit at NYS DEC). All of those contacts were made in 2000 and 2001. This meets the recommendation by the Service that developers should attempt to team or involve such agencies early in the process.

Reference Site. Choosing a nearby reference or worst-case scenario site to use as a comparison with the project site was not possible. The process of choosing such sites is fraught with assumptions about high risk at wind power projects that have not been demonstrated outside of the Altamont Pass Wind Resource Area of California. The selection of a worst-case scenario site would necessarily assume that that site would incur high risk rather than being based on biologically verifiable impacts. If the U. S. Fish and Wildlife Service knows of such sites, they

would be used in this and other studies. It should be noted that the Phase I report does make comparisons to worst case scenario wind power situations such as the Altamont Pass Wind Resource Area as well as comparisons to sites where risk has been demonstrated to be not biologically significant. The Phase I risk assessment makes further comparisons to the impacts of communication towers of various sizes, lighting specifications, and construction types (guyed vs. unguyed). This type of comparison is particularly important because there is a large body of research on communication towers, including towers in the eastern United States.

Alternate Sites-Projects. This is problematic as the project started well before Service guidelines were released. The developer should be contacted for an explanation of the process used to examine other sites in upstate New York prior to selection of the Flat Rock site. The PII ranking protocol was not used.

With respect to building an alternative type of electric generation facility, the developer is not likely to be interested in building fossil fuel or other polluting facilities, especially when such a benign and nonpolluting technology is available.

Checklists. Although the checklists supplied in the Service's guidelines were not followed per se, the Phase I assessment included descriptions of the habitat and topography of the site and surrounding areas that provide a more detailed description of habitat than do the Service's checklists. For example, the risk assessment describes the type of habitat in different areas of the Flat Rock project area in terms of whether they are grasslands mowed for hay, old field successional areas with shrubs and brush, forest edge habitats, and interior forest habitats. These descriptions also include lists of plant species, primarily trees. There are also references to existing wetlands. The Phase I assessment examined whether migration pathways, ecological magnets, or other significant avian habitat is present, especially as they relate to listed species and species of special concern to federal and state agencies. The level of description exceeds that provided by the recommended checklists.

Conformance to Service Recommendations

Site Development – The Phase I Avian Risk Assessment covers much of the concerns voiced in the Service's guideline document – as follows.

- Letters of inquiry were sent to the U. S. Fish & Wildlife Service and New York State Department of Environmental Conservation soliciting records of listed species. Two sets of letters were received from those agencies regarding both the Phase I and Phase II areas. The latest dated letters were March 2003. In addition, habitat was examined to determine whether listed avian species are likely to nest or use the site.
- Specific attention was paid during the assessment process to migration at the project site, nesting birds, and raptor use.
- Configuring turbines in ways that would avoid potential mortality has not been demonstrated at any wind plant except the Altamont Pass Wind Power area in California. At other

locations, the numbers of fatalities are so small as to suggest that configuration of wind turbines is not meaningful.

- Fragmentation issues have been addressed in the risk assessment.
- There are no prairie grouse or similar species present.
- Road areas and habitat restoration are addressed in the risk assessment.
- Carrion availability is not applicable at the project site.

Wind Turbine Design and Operation – The Service’s recommendations were either made in the risk assessment or are routinely done at modern wind plants. Some Service recommendations are not applicable or incorrect.

- Tubular (unguyed) towers will be used to prevent perching. Whether or not meteorological towers will be guyed has not been determined.
- There is no basis for the Service’s recommendation that “only white strobes should be used at night” on wind turbines. The basis for this comes from communication towers, for which the FAA requires very different lighting. It should be noted that communication towers have been deployed with L821 **steady burning** red that have been demonstrated to attract birds to those towers. Wind turbines never have steady burning red or any other color lights because the FAA does not require them. Instead, red strobes or red incandescent blinkers are usually used, so lighting is far less than on communication towers. For the Flat Rock project red strobes (L684 type) are recommended. These lights have not been demonstrated to attract night migrating birds and there have not been large-scale mortality events involving night migrating birds at wind turbines. Also, lighting for wind turbines is determined by FAA.
- The recommendation to adjust tower/rotor height is problematic difficult to understand and it is unclear what this would accomplish.
- Underground electric lines and APLIC guidelines have been recommended in the risk assessment.
- Seasonal concentrations of birds are addressed in the risk assessment. The appropriateness of shutting down turbines is dependent on the level of impacts, which cannot be determined before construction. However, the risk assessment does not suggest that large numbers of fatalities will occur and the fact that large-scale mortality events or large numbers of birds have not been killed by wind turbines does not suggest that shutting down turbines is warranted.

Overall, the Service interim, voluntary guidelines could potentially provide a means of evaluating wind power sites for wildlife impacts. However, they need a thorough review from the scientific community, industry, and environmental organizations prior to them being required for wind power projects. Most importantly, the guidelines and recommendations should be

vettted and validated, as do the protocols for ranking a site as to potential risk. Until such validation of the guidelines has been done, it is difficult to determine how valuable the guidelines are. Those recommendations that have been validated, such as undergrounding all collection lines within a site, have been adopted in the Phase I avian risk assessment for the Flat Rock project.