SUPPLEMENT TO AVIAN RISK ASSESSMENT AND BREEDING BIRD SURVEY EAST HAVEN WINDFARM -- EAST MOUNTAIN DEMONSTRATION PROJECT

Response to Comments from VINS, Vermont ANR, and USFWS

(November 4, 2003)

10-15-03 e-mail from Dr. Chris Rimmer, Vermont Institute of Natural Sciences

In Dr. Rimmer's review of the Phase I avian risk assessment and breeding bird study reports for the East Haven Windfarm, he poses several questions and comments about the methodology and information base used. Responses to those comments follow.

- ***Dr. Rimmer asked why certain reports that he and his colleagues published were not referenced in the risk assessment and breeding bird study.***

  Response. I have now reviewed Dr. Rimmer's comments on my reports. They added to my own understanding of the species involved, but the reports did not substantively change the risk assessment and my conclusions. These documents are especially important however with respect to post-construction habitat restoration or reforestation because they provide critical insight regarding the habitat requirements of various species, especially Bicknell's Thrush.. There are other aspects of the reports that will be helpful in designing any post-construction studies that may be done at the East Haven Windfarm.

- ***Dr. Rimmer asked why we chose 85 meters as the interval between point count locations and why we did not use more standard methods. He suggested that our methods may have resulted in overestimating the numbers of individuals present because our point count locations were close together.***

  Response. An avian risk assessment of the type conducted here is applied science that differs somewhat from the type of basic research that Dr. Rimmer and his colleagues conduct. The usual methodology used by many scientists to **sample** forest nesting birds at intervals of several hundred meters could have resulted in missing species or individuals. The reason they use sampling techniques is because the goal is to determine patterns of bird distribution and abundance over very large geographic areas. By using 85 m intervals we insured that we did not miss any bird species. We actually attempted to do a **census** of the birds present. Our data is, in fact, quite rich in that we recorded distance and direction of each bird from the point count location. This permits us to map the entire mountaintop with respect to any bird species, if called for. This will be useful for postconstruction monitoring. Although I don't believe it would add new or useful information at this stage, the data could be reanalyze by simply eliminating every other point.

- ***Dr. Rimmer suggested that nesting bird monitoring be done immediately after construction, rather than waiting for 3 or more years.***

  Response. In recent years there has been a greater appreciation for long-term studies of nesting birds. By waiting for several years after construction to monitor the East Mountain avian community we would gain a better understanding of long-term impacts of the project rather than a short-term study which would not be as robust. We now have provided a means of looking at long term impacts and responses of birds to wind turbines in forested environments, something that is frequently requested in situations like the present one. As I stated in the report, the reason for the delay is to give birds a chance to habituate and for habitat to recover following construction and presence of workers. Certainly, the impact one year after construction is likely to be greater than 3 or more years. The key question, in my view, is whether birds at the East Haven site will habituate to the presence of turbines. That cannot be answered one year after construction.

- ***Dr. Rimmer requested more specific recommendations for future monitoring.***

  Response. I am unsure what Dr. Rimmer is looking for here. Is he asking for postconstruction monitoring of nesting birds or for avian fatalities? I am not sure as to the detail that can be given at this time without knowing more about Dr. Rimmer's concerns and those of the regulatory agencies and biologists.

- ***Dr. Rimmer requested a discussion of vegetation management techniques.***

  Response. Given that there will be very limited new clearing needed to construct the turbines and associated equipment (estimated to be only 0.5 to 1.0 acres of footprint impacts), a detailed vegetation management plan may not be warranted at this stage. Dr. Rimmer was probably not aware of how limited the construction impacts would be. At the same time, it would certainly be prudent where feasible to plant trees and other vegetation to offset losses; alternatively, soil should be prepared to permit recolonization by the same species (and genotypes/provenance) present on site currently. Also, some modification of forest may be helpful adjacent to the site to expand the types of habitats required by more sensitive species such as Bicknell's Thrush.

- ***Dr. Rimmer questioned the premise that the Searsburg site offered a valid comparison to the site on East Mountain..***

  Response. I agree with Dr. Rimmer that vegetatively the two sites are quite different. The East Mountain site is dominated by montane conifer forest, whereas the conifers at Searsburg

are present in patches separated by hundreds of yards of deciduous forest. The validity of comparing East Mountain and Searsburg is based on the two locales having a very similar species composition. My assessment was for birds and if the same bird species are at both sites, impacts can be expected to be similar or comparable. The species list in the Searsburg report demonstrates considerable overlap (about 20 species in common) in species present at East Mountain. This suggests that the impacts are comparable, at least for these species. Dr. Rimmer is correct that the two sites are not comparable with respect to Bicknell's Thrush, as they are not present at Searsburg. I took this into account in my original report by separately analyzing this species.

- ***Dr. Rimmer was extremely interested in the sightings we made of Black-backed Woodpecker, Gray Jay, and Boreal Chickadee. He stated that "As far as I know, none of these species have ever been documented to breed in montane forests of Vermont."***

  Response. I too was surprised by the presence of Black-backed Woodpecker, but not as surprised that Gray Jay and Boreal Chickadee were present. I am highly confident that these species were in fact present. James Dowdell, the field birder-technician, is one of the most competent field birders in the United States. I think it is safe to say that the Boreal Chickadees nest locally. Gray Jays may nest farther away and were wandering when they were observed. The fact that a young bird was with an adult is suggestive that they nest somewhere in the general area of East Mountain. I also feel that the woodpecker may not nest at the site because they normally nest in black spruce bogs/swamps, at much lower elevations. They also wander widely.

10-27-03 Telephone Call with Vernon Lang, U.S. Fish and Wildlife Service

Two substantive issues with respect to bird impacts emerged from the conversation with Vernon Lang, U.S. Fish and Wildlife Service.

- ***Mr. Lang noted the paucity of data on bird migration at the East Haven Windfarm site. He suggested that the Service may recommend that pre-construction radar and acoustical studies be conducted to study night migration over the site. Mr. Lang's rationale was that because not enough was known about bird migration in northern Vermont, such a study would provide more thorough information for assessing risk. Implicit in these concerns is the assumption that the project could result in large numbers of collision fatalities.***

  Response. The avian risk assessment report for the East Haven Windfarm provided a substantial amount of information on the numerous studies done across the United States, Canada, and Europe regarding the numbers of birds that collide with wind turbines. Those studies report the numbers of birds killed on a per turbine basis and how many of each

species are killed overall. In no case has there been a single, large-scale mortality event like those reported from tall (>500-600 feet) communication towers. Wind turbines have repeatedly been documented to kill very few night migrating birds. The avian risk assessment report provided numerous references to support the conclusion that collision impacts will not be ecologically significant at East Mountain. With respect to the eastern United States, fatality studies have been done at Searsburg, VT; Madison, NY; Somerset, PA; Buffalo Mountain, TN; and, most recently, Backbone Mountain, WV. Also, in Minnesota and Wisconsin, states where large numbers of birds migrate (many of which are the same species as in Vermont), intensive, multi-year studies have shown that wind turbines have not killed large or biologically significant numbers of birds, even where there are dozens or hundreds of turbines. The weight of evidence suggests that relatively few migrants are killed by wind turbines, no matter where they are erected.

In my opinion, radar and acoustical studies have become a perceived panacea with respect to assessing or predicting risk of night migrating birds. However, empirical studies do not suggest that these methods are reliable or valid predictors of high collision risk. The reason seems to be that few birds are killed and that being the case, radar studies could not predict high risk. Radar studies have been conducted at several sites around the United States. One of the best examples comes from Minnesota where radar detected that more than about 3.5 million birds migrated over the wind turbine areas. A four-year long post-construction study documented about 40 carcasses (although more were likely to have been present) of night-migrating birds and concluded that the impacts were not biologically significant. That study involved a review committee that included the state wildlife agency and other stakeholders.

Acoustical studies have been conducted at a few study sites and they have not been demonstrated to have a robust ability to predict collision fatalities. Since the 1960s, acoustical data have been shown to be biased and faulted. They do not provide an accurate representation of the species that are passing overhead, the numbers of birds on a given night, or the altitude of migration. The best example of how acoustical studies have failed to predict collisions of night migrating birds comes from Wisconsin. In that state, pre-construction acoustical studies suggested that tens of thousands of night migrants flew over the project site at low altitudes, thereby putting them at risk. Rigorous post-construction fatality studies revealed only 5 fatalities of night migrating birds, none of which were among the ten most numerous species heard migrating overhead. The pre-construction study suggested risk to Cape May Warblers (a Wisconsin species of concern) because they were thought to be numerous. Not a single carcass of this species was killed by the turbines.

Without validation of these two technologies, they cannot be deemed reliable and, to date, the few studies done using these methods have not been shown to be valid predictors of risk.

In sum, fatalities of night migrating birds have never been shown to be great or biologically significant at wind power facilities. Intensive radar and acoustical studies, which have been

shown to be of limited value for predicting risk, is unwarranted. The fact that there are only four wind turbines further suggests low risk to these birds and that long-term pre-construction studies are not indicated.

- ***Mr. Lang suggested that post-construction mortality studies would not provide reliable data because they would be hampered by the thick vegetation that surrounds the summit.***

  Response. Although the brush may be thick, post-construction studies can be done in a way that accurately measures the numbers of birds killed by wind turbines. The wind power industry has consistently done post-construction studies at wind power sites across the United States, as well as in Europe. Studies have routinely tested searcher efficiency (the percentage of the actual number of dead birds found by the searcher) and scavenging (how many of the carcasses are removed prior to and between searches by scavengers), and have done so in a variety of settings and habitats. The East Haven Windfarm admittedly offers a challenge, but dead bird searches have been done in forests before, mostly when studying communication towers. Here in Vermont, VINS conducted a study of montane habitats at high elevations in which they searched for dead birds under communication towers. I would recommend consulting VINS' methodology if post-construction studies are done at East Haven.

  The East Haven Windfarm project has only 4 turbines, which makes it possible to spend more time searching under each turbine. There are also other methods that can be used to determine whether the searcher is finding all the birds. In California, I participated in a study in which a trained bird-dog was used to locate dead birds in much the same way hunters in Vermont and elsewhere in the northeast use dogs to hunt woodcock and grouse. This method could be employed as a test to determine how many of the dead birds at a site are actually found, thereby setting a coefficient of detectability for human observers. It should be noted that the methods used at most wind power projects have been scrutinized by Technical Advisory or Technical Review Committees (TAC or TRC) consisting of representatives from wildlife agencies such as the U. S. Fish and Wildlife Service and state wildlife agencies, Audubon, and other nonprofit environmental organizations. These TACs have reviewed the methods used at various projects to insure that they have been done properly and produce valid results.

  The topographic and physiographic conditions at the East Haven Windfarm do require special consideration, but the difficulties are certainly not insurmountable and methods can be devised to accurately measure avian fatalities at that site.

10-10-03 Conference Call with John Austin and Everett Marshall, Vermont Department of Fish and Wildlife

- ***Mr. Austin suggested that little is known about bird migration over the State, specifically night migration of songbirds during autumn and spring. He suggested that studies are needed to learn more about the patterns and behaviors of birds that migrate over Vermont.***

  Response. This comment is essentially the same as noted above for Vern Lang. The avian risk assessment report has an entire section on night migration and that section still applies.

  First, the available literature does not show concentrations of night migrating birds anywhere with the exception of a few ridges and coastlines and those concentrations do not appear to occur at night. Instead, they occur in daytime following broad-front migration at night. All of the major texts on bird migration were consulted to determine if there was any suggestion that night migrating birds follow mountain ridges or were concentrated at high mountaintops. Not one reference was found in any of the texts examined including those from Europe. I also contacted one of the leading migration biologists in this country and he had never heard of any studies that had documented night migrating birds following mountain ridges or concentrating on tall mountaintops during night flight. Having written a migration book that is used as ancillary reading for some college-level courses, I am very familiar with the literature.

  The weight of evidence from many different sources suggests that night migrating songbirds are spread throughout the atmosphere and not concentrated into narrow pathways as are some other species. Raptors, waterfowl, and some other birds do concentrate at topographic sites, but these birds are usually daytime migrants. To my knowledge virtually all night migration of songbirds occurs over a broad front without concentrations or pathways. This has been found to be the case in Europe and the United States and has been reported in radar studies conducted over more than 50 years.

  Finally, I conducted a ceilometer study of night migrating birds at Searsburg, Vermont, in a forest at an elevation of slightly above 2,900 feet ASL. That device has been widely used to gauge the density of night migration in many places in the United States and Europe. The numbers of night migrating birds recorded over the mountain at Searsburg during four migration seasons -- two springs and two falls -- were small, not exceeding about 5 birds observed during 20 minute observation periods. This data did not indicate any sort of concentration or above average numbers of migrants. These findings agree with the literature and do not suggest concentrations.

  If the federal or state resource agencies have information that suggests anything other than broad-front migration in areas such as the jumble of mountains and hills that make up the Northeast Kingdom, I would certainly review the information and take it into account.

- ***Mr. Marshall inquired about bat fatalities, seeking more information regarding bat fatality rates at other wind plants and the likelihood of fatalities at the project site.***

  Response: I briefly assessed risks to bats at the project site and my conclusions are reported in the Phase I avian risk assessment. I approached this task from the perspective of a bird biologist who has extensively studied the impacts of winds farms and telecommunication facilities. In doing so, I have exchanged information with biologists who concentrate on bats. I also reviewed studies that report the numbers of bat fatalities and species involved at about a dozen sites around the United States. A summary of bat fatalities at wind power facilities is provided in "*Synthesis and comparison of baseline avian and bat use, raptor nesting, and mortality information from proposed and existing wind developments"* (Erickson, et al., Bonneville Power Administration, 2000). With respect to the federally endangered Indiana bat, I relied on my personal knowledge of the species, the literature on wind power fatalities of these species, and what is known about the habitats used by these animals, including information on the U. S. Fish and Wildlife Service website.

  Biologically significant risk to bats resulting from construction and operation of a small wind power facility in northeastern Vermont is not likely to occur. This is based on the fact that bat fatalities have totaled a maximum of about 10 bats killed per turbine per year and those fatalities are spread over about 6 common species of tree nesting bats, none of which are endangered or threatened. If this worst-case scenario were to occur at East Haven Windfarm, these numbers are not likely to be biologically significant. The high elevation habitat at the summit suggests that large numbers of bats are not likely to use the project site.

  To my knowledge, Indiana bats have not been reported to collide with either wind turbines or communication towers, despite a plethora of studies of these structures within the range of this species. It should also be noted that letters from both U. S. Fish and Wildlife Service and the Vermont Natural Heritage Program did not mention the presence of Indiana bat caves/hibernacula near the project site. In such letters, the Service generally states whether such caves are within 5 miles of a project site and in some cases (personal experience in three other states) they have mentioned that caves are within 7 to 28 miles from a proposed project. With respect to foraging and habitation of the East Haven Windfarm by Indiana bats, the habitat near the summit of East Mountain is, in general, not suitable. The trees do not have exfoliating bark, behind which Indiana bats roost during the day and leave their young while females forage. Furthermore, the night-time temperatures are too low for young bats to be left while mothers forage. The young bats would simply die if left in these high elevation sites, because they are unable to thermoregulate. Therefore, significant Indiana bat activity at and near East Mountain is unlikely.