STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Petition of BNE Energy Inc. for a Declaratory Ruling for the Location, Construction and Operation of a 4.8 MW Wind Renewable Generating Project on Flagg Hill Road in Colebrook, Connecticut ("Wind Colebrook South")	**Petition No. 983** **March 15, 2011**

PRE-FILED TESTIMONY OF D. SCOTT REYNOLDS, PH.D.

Q1. Please state your name, employer and your employer's address.

A1. My name is Dr. D. Scott Reynolds, principal of North East Ecological Services, 52 Grandview Road, Bow, New Hampshire.

Q2. Please describe your background, training and area of expertise.

A2. I am a biologist that has been working with bats for almost twenty years, and working with the impact of wind turbines on bats for seven years. By training, I am a population biologist and physiological ecologist with a Ph.D. from Boston University. I am currently a Visiting Scholar at Boston University and a Certified Senior Ecologist with the Ecological Society of America.

In addition to teaching at St. Paul's School in Concord, New Hampshire I have an ecological consulting firm named North East Ecological Services ("NEES"). NEES conducts wildlife surveys in relation to endangered species, conservation biology, or impact assessments such as wind development. NEES is contracted by a variety of customers, including state and federal agencies, non-profit organizations, and commercial developers. NEES was the first to design and implement long-term acoustic monitoring at potential wind development sites and many of the designs and methodologies developed by NEES have been incorporated into state and federal guidance documents. A copy of my current CV is attached to this testimony.

Q3. Have you testified before the Siting Council before?

A3. Yes, I submitted pre-filed testimony regarding the BNE Energy, Inc. ("BNE") petition to site a wind project in Prospect, Connecticut in February 2011 and concurrent herewith have submitted pre-filed testimony regarding the BNE petition to site a wind project on Winsted-Norfolk Road in Colebrook, Connecticut. I have also testified at County Commission hearings in Virginia, The Public Service Commission of West Virginia, the Public Service Commission of Maryland, and the Vermont Public Service Board. In all the above cases, I was contracted by the wind developer to provide expert testimony in regards to the impact of the proposed wind project on bats.

Q4. Please describe your involvement in this proceeding.

A4. I was retained by Reid and Riege, PC on behalf of FairwindCT, Inc., Susan Wagner and Michael and Stella Somers to provide independent expertise on the proposed BNE Wind Colebrook South turbine project, in regard to bat survey techniques and the impact of wind development on bats. I have reviewed and commented upon the Western EcoSystems Technology, Inc. ("WEST") interim report (attached to the petition as Exhibit L) (the "Interim Report") for the Colebrook project site.

Q5. Please summarize your findings and comments with respect to the WEST Interim Report.

A5. WEST is a highly reputable ecological consulting group, but this Interim Report, similar to the research that was conducted by WEST at the Prospect Wind project site, does not represent an approved or adequate methodology to effectively characterize the impact of development of the Colebrook Wind Resource Area South ("CWRAS") project site in regards to bats. As far as I can tell, WEST was contracted by BNE to design, conduct, and generate a report for a pre-construction bat acoustic survey at the CWRAS. The Interim Report contains methods, results, and analysis of data collected from 25 June through 31 August, 2010, although according to WEST, additional data were collected through 31 October, 2010; these data have not been reviewed by NEES as they have yet to be made available at the time of this deposition. The acoustic monitoring outlined in this report was characterized as a 'maternity season' survey despite the fact that they did not sample almost half of the recognized summer maternity period. The acoustic monitoring locations lacked adequate spatial, temporal, and vertical variation to properly assess the bat activity across the CWRAS project site, and none of the monitoring was done within the rotor swept area of the proposed turbine despite the presence of a meteorological tower on the project site. The timing and lack of vertical sampling suggest that the monitoring survey was not adequately prepared, designed, or funded by the developer.

The data analysis approach used to categorize and interpret the bat activity at the CWRAS is not ecologically or statistically sound, resulting in the paradoxical and untenable conclusion that the two most likely impacted migratory bat species (the red bat and hoary bat) represent only 0.2% of the total bat calls despite the fact that the sampling groups that contained them represented over 86% of the total bat activity. In general, the Interim Report does not provide adequate information, nor does it even address bat activity levels at the project site during the period of peak wind-related mortality. Given these oversights and omissions, it is impossible to make any conclusion as to the level of bat activity at the CWRAS project site. Consequently, it is impossible to state the likely impact of wind development at the CWRAS site on bats given the lack of useful baseline data. If the Siting Council is concerned about the impact of the construction and operation of the CWRAS on regional bat populations, it must find that the Interim Report fails to properly address their concerns.

Q6. What are your greatest concerns about the WEST Interim Report?

A6. The Interim Report has many deficiencies. Although some of them may be addressed by the final report, there are basic fundamental design issues that can't be easily resolved. Given that the original intent of the study was "to characterize seasonal and spatial activity by bats within the CWRA during the maternity season" (BNE Petition 983, Volume 1), my biggest concern is that the lack of seasonal and spatial variation in the sampling protocol preclude a successful result. Missing almost half of the maternity season, sampling at only a single habitat type, failing to sample at the sites likely to have high bat activity (the beaver pond and the forested wetlands), and having a defective acoustic monitor at one of two sites, appears to prevent an accurate characterization of the site.

Failure to utilize the existing meteorological tower as an elevated platform is also a major concern because the lack of vertical sampling prevents a full understanding of how bats are using the airspace at the CWRAS project site. I am also concerned that WEST mischaracterized the level of bat activity at the project site (28.1 calls/dn) as similar to levels at other project sites given that 1) it should have been double this value once you exclude the CA2 sampling point, 2) the sampling location was not one of the critical habitat types that they could have sampled, and 3) many of the comparison sites cited by WEST (Table 4) were post-construction surveys (after the habitat had been altered), based on fall acoustic monitoring, and used elevated sampling platforms.

Further, I am concerned that the Interim Report fails to provide any information relative to the fall migratory period, when the majority of bat mortality is known to occur. Given that most of the bat activity at the CWRAS project site comes from low frequency ("LF") and mid-frequency ("MF") bats (which contains all the migratory bats), and given that the activity rates documented at the CWRAS project site are relatively high compared to other sites in the northeast, the Petition's conclusion is unsubstantiated.

Lastly, I am concerned that failure to follow any of the accepted state or federal monitoring guidelines, or to follow the best practices accepted by scientists in the field, prevents anyone from understanding how bat activity at this study site compares with activity from other project areas. In light of the fact that the study outlined in the Interim Report does not meet the minimum pre-construction monitoring guidelines of any research entity or regulatory agency in terms of design or duration, it would appear to be inadequate to characterize the potential impact of wind development on bats at the project site.

Q7. Please provide some background with respect to the development of our knowledge concerning the impact of commercial wind turbines on bat populations.

A7. Commercial wind development is the fastest growing source of energy in the United States (Martinot & Sawin 2009). The potential for large-scale commercial wind turbines to have a negative impact on bat populations first became apparent when post-construction bird surveys at the Mountaineer Wind facility in West Virginia found large numbers of dead bats during the fall migratory season (Kerlinger & Kerns 2004). Since 2004, it has become apparent that wind turbines are killing large numbers of migratory bats throughout North America. In particular, serious concerns have been raised over the level of bat mortality at wind sites in the eastern United States, with mortality rates as high as 63.9 bats/turbine/year (Fiedler et al., 2007).

Q8. What has the data collected since 2004 shown with respect to the impact of wind turbines on bat populations?

A8. Data collected over the last several years has shown that the migratory bats (hoary bats, red bats, silver-haired bats) are more susceptible to wind turbine mortality than are hibernating bats (the *Myotis* bats and big brown bat). Specifically the hoary bats, red bats, and silver-haired bats usually account for over 80% of all bat mortalities (Johnson 2005). Temporal analysis of the mortality data show that most of this mortality occurs during the fall migratory period. Therefore, the distribution and timing of mortality seems to be biased toward non-hibernating migratory bats in the process of migrating. The reason for these species being at higher risk of collision mortality is uncertain, although it may be related to their broad geographic distribution and unique aspects of their mating behavior (Cryan 2008; Cryan & Barclay 2009).

It is likely that these large geographic ranges and the long-distance migratory behavior of these species expose them to a higher risk of turbine-related collision mortality. Although none of the migratory bats are protected by federal statute, the cumulative impact of their mortality is likely to be substantial. The only federally endangered bat in the northeastern United States (the Indiana myotis) is relatively unimpacted by wind development, even when projects have been built within ten miles of known hibernacula. To date, there has only been one documented mortality event of an Indiana myotis at a wind development site (Fowler Ridge Wind Project, Indiana: USFWS 2010b).

It is difficult to identify the key physiogeographic features that increase bat mortality at any proposed wind turbine project. However, the data are consistent in several regards. First, projects located in the eastern United States appear to have higher mortality rates than projects in the midwest or western regions of the country. Second, many of the high mortality sites are located along mountain ridgelines; although some lower elevation sites also have high mortality, there appears to be a correlation between topography and bat mortality. Third, within the eastern projects, bat mortality tends to be higher in the southern projects relative to the northern projects. It is likely that southern sites are causing significantly more mortality because bats are more abundant in this region.

Q9. Are there commonly accepted mechanisms for evaluating the potential impact of a wind development site on bat populations? If so, please describe.

A9. In reaction to the high mortality of migratory bats found at the Mountaineer Wind facility in West Virginia, the United States Fish and Wildlife Service ("USFWS") released an interim guidance document in May 2003 that identified ten recommendations for pre- and post-construction monitoring for wildlife impacts (USFWS, 2003). The pre-construction recommendations were focused on a variety of potential research methodologies (acoustic, infra-red camera imaging, and radar). They also outlined recommendations for post-construction mortality surveys using many of the same technologies. Although the document was both voluntary and interim in nature, it has been used by several state wildlife agencies to represent the recommended methodology for wildlife surveys during the permitting phase of a wind development project. These interim guidelines have recently been used by the Wind Turbine Guidelines Advisory Committee to develop a set of Recommended Guidelines (USFWS, 2010a).

The primary mechanism for evaluating the potential impact of a wind development site is a site risk assessment or "Site Characterization" (USFWS, 2010a). The Site Characterization would include identifying any known species of concern on or near the proposed site or any habitat that may exist for these species. For bats, this would, at a minimum, include information about known summer and winter populations of endangered or threatened bats on or near the project site. In addition to this, the Site Characterization is supposed to identify "critical areas" or "critical habitat" that may be present for these species, and if forests are present at the project site, the type, age, and snag density of the forested habitat. Although "near" is a subjective term, the California Energy Commission ("CEC"), in their Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development (CEC, 2007), defines "near" to refer to any distance that is within the area used by an animal in the course of its normal movements and activities; for bats, 'near' can be as far away as 50 miles).

Typically, Site Characterizations also identify knowledge gaps that exist relative to the project site and outline potential methodologies to fill those gaps. This often involves a recommendation to collect data on bat use at the project. The most common method for collecting bat activity at wind development sites is acoustic monitoring. Acoustic monitoring, in the context of a pre-construction survey, is the use of long-term ultrasonic recording devices to document the echolocation call activity of bats as they move across the landscape. A well-designed acoustic monitoring survey characterizes the project site in three dimensions by sampling in multiple habitats and at multiple altitudes over long periods of time. When interpreted accurately, such surveys are currently the best method of obtaining general information on the bat utilization of the project site, and consequently the best method of determining the significance of project development on bat activity and mortality. This view is shared by most bat biologists, state wildlife agencies, and the US Fish and Wildlife Service.

Q10. Does BNE's petition comply with the commonly accepted mechanisms for evaluating the potential impact of a wind development site on bat populations?

A10. No, the Interim Report is deficient in multiple respects. First, almost all of the state, federal, and scientific advisory guidelines specify using high altitude sampling platforms when available. Such a platform was available at the Colebrook site but BNE chose not to use it. Second, almost all of these same guidelines require at least one full year of acoustic monitoring, usually defined as April through October or November; the Interim Report only contains data from two of these six months. Third, all of the guidelines recommend a survey protocol that is capable of characterizing the habitat variation that exists on the project site; the more habitat types that exist on a project site, the more sampling points that are needed to characterize bat activity throughout the project area. The use of only a single acoustic sampling point (given that CA2 was defective) in a single habitat type clearly does not meet this recommendation. Lastly, the BNE Petition fails to meet the objectives of the USFWS Site Characterization by failing to adequate document critical habitat features for the tree-roosting bats; this includes a failure to adequately characterize the forested habitat in terms of stand density, snag density, or other commonly accepted predictors of bat presence within a landscape.

Q11. Based on the information provided by the BNE consultants, how would you describe the Colebrook project site?

A11. The Interim Report provides a basic overview of the project site, including an aerial photographic map that identifies key habitats, potential turbine locations, and acoustic monitoring sampling points. According to the Interim Report, the CWRAS is an 80 acre site located in Colebrook, Connecticut on an elevated ridgetop (elevation of 457 m asl). The report paraphrases from the Habitat Study conducted by Vanasse Hangen Brustlin, Inc. ("VHB") on behalf of BNE (Exhibit I of the Petition). In the VHB Habitat Study, six distinct habitats were identified on the CWRAS project site (early successional northern hardwood forest, second growth northern hardwood forest, early old field meadow, palustrine forested wetland, palustrine scrub/shrub - emergent wetland, and open water). The Interim Report identifies a manmade impoundment (presumably the beaver pond identified in the Habitat Study) on the western side of the project, roughly 500 ft (0.09 miles) south of a proposed turbine location (Tidhar et al. 2010). The map (Figure 1) also identifies five wetland areas within or adjacent to the CWRAS project site and a 3.5 acre hilltop meadow on the eastern side of the project site.

Q12. Do you have any concerns about the conclusion given in the Interim Report in regards to the presence of critical bat habitat on or near the project site?

A12. A Site Characterization is supposed to provide information on the likely presence of bats based on documentation of critical bat habitat. The Colebrook South petition concludes that the "CWRA is not in the vicinity of any known bat colonies or features likely to attract large numbers of bats." (BNE Petition 983, page 23). However, the report fails to define the phrase "in the vicinity" or document what efforts were undertaken to document the presence of bat colonies or roosting habitat. Given that the majority of the project site, including the location of all three proposed turbines, is in second-growth northern hardwood forests that are of a size (12+ inches dbh) and species composition commonly used by tree-roosting bats (Hutchinson and Lacki, 2000; Menzel et al. 2001; Kurta and Rice, 2002; Perry et al. 2007; Timpone et al. 2010), it is unclear why there was no effort to document the critical bat habitat at the project site. This would have included, at a minimum, providing data on tree roosting habitat within the CWRAS, including information on snag density, average tree size, species composition, and other commonly measured forest descriptors that should have been used to estimate the likelihood that tree-roosting bats, including the Indiana myotis, would utilize the CWRAS project site during the summer months. These efforts are typical of pre-construction site assessments, would have met Objective 1 of the USFWS Site Characterization, and have been made by WEST at other project sites in the east, including the NedPower Mount Storm site in Virginia (Johnson & Strickland 2003).

Another major habitat feature overlooked in the Interim Report is the open water created by the beaver pond. Permanent water bodies generally attract large numbers of foraging bats and, as a result, have more bat activity than most other habitat types. In a pre-construction survey I conducted at the Maple Ridge Wind Project (Lewis County, NY) , permanent water sites had more than twice the level of bat activity as any other habitat type that I sampled (including forest trails and fields: Reynolds, 2004). In addition, swamp and wetland habitat had the highest species diversity of any sampled habitat, including forest trails and fields. (Reynolds, 2004). By any reasonable standard, the beaver pond and forested wetlands would be considered critical habitat near or "in the vicinity" of the proposed turbines.

Q13. Did you review the acoustic monitoring equipment and calibration protocols employed by WEST? If so, please compare the methodology used by WEST to standard and accepted equipment and protocols.

A13. The methodology for acoustic monitoring has become relatively standardized over the last several years as state agencies have developed guidelines and recommendations for wind developers and their consultants. Variation in the monitoring protocol usually focuses on 1) equipment, 2) analysis methodology, 3) study duration, 4) study intensity, and 5) sampling altitude.

For equipment, most states recommend, implicitly or directly, the use of acoustic detectors such as the Anabat SD1 used by WEST at the CWRAS site; the Anabat system is a very popular and reliable sampling platform used by bat biologists across the world. WEST states that they ensured similar detection ranges among the Anabat units using a BatChirp ultrasonic emitter; again, this is a fairly common practice to confirm operation and functional distance of the acoustic monitors. Unfortunately, WEST fails to identify what this detection distance was, instead relying on the 30 m estimated range from a previous published study (Fenton, 1991).

They also stated that the noise files (files that contain ultrasonic noise but no evidence of bat calls) in a given week ranged from 1.8 - 194.8 files (Tidhar et al., 2010). They present this as a potential concern because the noise "may have interfered with overall data collection". Although WEST does not provide an estimate of the total number of noise files, it appears to be approximately 30% of the total data (based on Figure 3). In my experience running long-term acoustic monitoring that extends throughout the night, this is a very low number of noise files. Given that these systems were running from 17:00 - 09:00, and that they were ground-based systems at a site which by its very nature is windy, a high number of noise files should have been expected due to wind noise and insect activity.

The lack of noise files makes me concerned about the sensitivity settings of the Anabat systems and the calibration of the microphones. In projects that I have conducted in similar habitats, the percentage of usable calls (calls with clear bat activity) usually falls within the range of 0.3% - 4.5% of the total files. Given that the scale on the Anabat sensitivity dial (1 - 10) is an approximation of a logarithmic function for sampling volume, even small changes in sensitivity (from 7 to 6) can represent a large decrease in total sampling volume. The relative lack of noise files from the CWRAS site suggests that these microphones where not set at the optimal sensitivity (typically about 7), and therefore the sampling distance they estimate in their report (30 m: Fenton, 1991) was not obtained.

Q14. Did you have any concerns about the location or condition of the acoustic monitoring sites outlined in the Interim Report?

A14. Yes. Given the habitat diversity at the CWRAS project site as described by the Habitat Survey, I was surprised to see that WEST placed both of their monitoring stations in the same habitat type (both along abandoned forest trails within the deciduous forest habitat). It is impossible to determine the precise location of the sampling points given the low resolution of the site map used by WEST (Figure 2); based on their description, both sampling points were near proposed turbine sites on the northern side of the project area. Similarly, it is impossible to determine the distance between the sampling points.

Given the similar habitat and close proximity, it was surprising to learn that 99% of the total bat activity was recorded at a single site (CA1). In an attempt to explain the lack of bat activity at the CA2 site, WEST states that "further investigation of detector functionality is needed and will be carried out prior to completion of the final annual report to ensure differences are not the result of equipment malfunction, which may have artificially biased the number of detections recorded." In a footnote to this statement, WEST admits that the CA2 detector was shipped to the manufacturer in Australia to determine the cause of the malfunction. Because basic functionality of an SD1 detector is easy to determine in the field, this footnote suggests that WEST was unable to show the CA2 system was operating when it was pulled from the project site at the end of August.

It is unclear why WEST chose to sample only one of the habitats within the project area, particularly since it is likely that at least three of them would have had higher levels of bat activity than forested trails (palustrine forested wetland, palustrine scrub/shrub - emergent wetland, and open water). Given that both monitoring stations were ground-based units and easily moveable, WEST should have sampled across a wider variety of habitats, including habitats likely to attract bats such as the open water and emergent wetlands. Given that the three species at highest risk of wind turbine collisions (eastern red bat, hoary bat, and silver-haired bat) are described in the Interim Report as being less able to maneuver in forested habitats and "utilize less forest-dominated areas", it is unclear why they chose to only sample forested habitats.

Q15. Do you have comments on the study intensity? If so, please explain.

A15. The total study effort of a project is typically dictated by the size of the project, the heterogeneity of the habitat types within the project area, and the degree of anticipated habitat modification following construction of the project. Wind development sites that I have been involved in have typically used from 1-4 elevated sampling platforms and up to 45 ground-based sampling points; this large variation is the result of differences in project size and habitat complexity. But every one of the turbine projects that I have worked on typically have at least one ground-based monitor and one elevated sampling platform. Elevated sampling platform are advantageous because they sample near or within the rotor swept area of the turbines;

unfortunately they are difficult to relocate and therefore are often used as stationary long-term monitoring platforms.

Ground-based sampling platforms have the advantage of portability and the capability of sampling in a variety of habitats but do not sample the altitudes that are responsible for wind turbine collisions and mortality. Ideally, an acoustic monitoring survey will take advantage of both systems by deploying both elevated and ground-based monitoring; this is the approach I generally encourage developers to pursue, and the approach I have employed at wind sites in Pennsylvania, Maryland, New York, New Jersey, and Massachusetts.

The Massachusetts project, for example, was a two turbine project similar to the CWRAS; it was located in a suburban landscape, contained second-growth forest with nearby wetlands, and even had a meadow habitat near one of the proposed turbines. At that site, we used an elevated sampling platform (an existing meteorological tower) as well as two ground-based systems to monitor bat activity at the wetlands. The protocol used at the CWRAS relied strictly on stationary ground-based acoustic monitoring in the same habitat. With this protocol, you fail to capture any of the spatial heterogeneity or vertical variation in bat activity that would be indicative of collision risk with the wind turbines. When project sites do not have elevated platforms to sample from, it is sometimes necessary to rely on ground-based monitoring. However, there was a meteorological tower available at the CWRAS site. It is unclear why BNE chose not to use this met tower as a sampling platform given that elevated sampling in general, and using met towers in particular, is the recommended protocol of the US Fish and Wildlife Service, the National Research Council, the Bats and Wind Energy Cooperative, and several state wildlife agencies, including Maine, New York, New Jersey, Pennsylvania, and California. In the Introduction to the Interim Report, WEST claims that the "protocol for this baseline study is similar to protocols used at other wind energy facilities across the United States"; however, they fail to cite even a single project that has used such a protocol. I am not aware of a single project conducted since 2005 (when the bat mortality issue first became acknowledged) that has relied on such limited survey protocol. Furthermore, I am not aware of a single research entity or state wildlife agency that recommends exclusively ground-based acoustic monitoring for pre-construction acoustic monitoring at a potential wind development site. I am also not aware of any multi-turbine project that has attempted to characterize the bat activity at a project site using a single ground-based acoustic sampling point.

Q16. Do you have comments on the study duration reflected in WEST's report? If so, please describe.

A16. Acoustic sampling is typically conducted for the entire active season, which extends from spring (early to mid-April) through fall (late October). Surveys that I have conducted for this entire duration (in Vermont, New York, Pennsylvania, Massachusetts, and Virginia) usually show very little bat activity during the first and last weeks of the study, suggesting they do in fact capture the vast majority of the seasonal bat activity.

The study period identified in the WEST Interim Report (25 June -31 August, 2010) is characterized as representing "the majority of the maternity season in central Connecticut" (Tidhar et al., 2010). However, this is inaccurate. The maternity season usually begins in late May when female bats return to their maternity roost areas and form colonies. By mid- to late-June, most bats would have already given birth to their young. By the end of July, most of these colonies would begin to disband as the bats prepare for migration or hibernation. For the Indiana myotis, the USFWS characterizes the maternity season as May 15 - August 15. The WEST survey missed 41 days (44%) of this sampling period, although it extended 15 days into what would be best identified as the fall migratory period.

Given that almost half of the maternity season was not sampled, it seems unwarranted to characterize this survey as a maternity season survey as outlined in the Interim Report. More importantly, given that the vast majority of bat mortality occurs during the fall migratory period, it is unclear how the impact of developing the CWRAS site can be estimated without more extensive monitoring into the fall season. I presume the final report will help clarify the overall bat activity at the CWRAS project site, but it is still not available for review.

Q17. Did you have any concerns about how WEST analyzed their acoustic monitoring data?

A17. Acoustic monitoring data are typically analyzed using quantitative or qualitative methods. Quantitative methods rely on statistic analysis of key call parameters to categorize calls by group, genus, or species; the underlying methodology is usually a discriminant functions analysis that compares the bat calls collected at the project site with a set of known reference calls for each species that could potentially be found within the project site. Qualitative analysis relies on the experience of an analyst to manually identify individual bat calls based on a dichotomous key created using a similar reference library of calls.

Several state agencies have suggested that quantitative analysis (such as performed by Britzke et al., 1999 or Robbins and Britzke, 1999) is the preferred method for analyzing bat data. However, they fail to acknowledge that quantitative methods have not been well-received within the bat research community because species call structure is so highly variable and proper reference calls are extremely difficult to obtain. As a result, many consultants rely on objective criteria to 'filter' calls into clusters and then a qualitative approach to identify calls within each cluster.

This semi-qualitative analysis represents a compromise between efficiency (automated clustering does not take long) and accuracy that is generally well-received by state and federal agencies; this appears to be the initial approach used by WEST. Although the details of their filter were not clearly stated in the Interim Report, they are several individuals at WEST that are familiar with Anabat so this should be a point of clarity, not concern. However, the method of categorization used in this particular survey (LF, MF, HF frequency groups) is unique, in my experience, for a project in the eastern United States.

Whereas many groups use LF and HF call groups (Arnett, 2005; Arnett et al., 2006; Redell et al., 2006), I have never seen a MF group used in the eastern United States. This is primarily because this group does not really exist; it is merely a subgroup of the HF category. In my experience, the two bats in the MF group (the little brown myotis and the eastern red bat) regularly produce calls above 40 kHz. This is consistent with WEST's own statement that "that "eastern red bats typically emit calls with minimum frequencies between 30 and 43 kHz" (Tidhar et al., 2010). As a result, it is clear that there is overlap between the HF and MF call groups that may explain the low percentage of HF bat activity. In any event, it makes interpretation of the data extremely ambiguous.

Furthermore, WEST justifies their "conservative approach" to call identification because of the "high overlap between some species" (Tidhar et al., 2010); in particular, they cite the "high intraspecific variability of Lasiurus calls" (which includes the eastern red bat) that make proper identification difficult, particularly using automated methods. As they state twice in the Interim Report (pg 7 and pg 11), "it is likely that more hoary and eastern red bat calls were recorded than were positively identified". However, WEST then states that "two species with distinctive call sonograms are the hoary bat and the eastern red bat" and then generate tables and figures (Figures 7 and 8) that analyze these species separately despite stating that each of these species comprised only 0.1% of the total bat calls in the project area. It is unclear how WEST can claim that these two species can have both highly variable calls (requiring a conservative approach) and distinctive calls (allowing species identification) in the same analysis. Given the low resolution of their species identification (only 8 of the 3,500 calls identified to species; 0.2%), it is clear that they can't claim both. Without continuous reinforcement of the caveat that these species have high overlap and that their species resolution includes only 0.2% of the total bat activity, the reader is left with the impression that these bats are uncommon at the project site, even though the call groups they belong to represent over 86% of the total bat activity. In my opinion, one should not justify and use a conservative approach (such as species grouping) and then focus the majority of the analysis and interpretation using a non-conservative approach that ignores 99.8% of the total bat activity.

Q18. Did you review WEST's overall bat activity rate? If so, do you have any concerns about these data?

A18. The total potential sampling effort by WEST at the CWRAS was 68 nights (25 June -31 August, 2010: 136 detector-nights). Due to the nature of long-term monitoring, researchers seldom collect data throughout the entire sampling period. WEST achieved a total of 125 detector-nights, with the loss of 11 detector nights due to equipment failure. Although WEST states that this is a 96.2% survey rate, I calculate this as a 91.9% survey rate. In either event, this is fairly consistent with projects I have conducted throughout the northeast (88% - 100%).

During the acoustic survey, WEST identified a total of 3,645 bat calls at the CWRAS site, for an overall activity rate of 28.1 calls/detector-night (c/dn) and a peak rate of 80.2 calls/dn. Given that 99% of the bat activity was recorded at CA1, and that WEST had serious concerns that the CA2 site was not functional, the actual activity rate is 55.4 calls/dn, twice the value cited in the Interim Report. This would put the bat activity at the CWRAS site well outside the range of existing pre-construction monitoring surveys cited in the Interim Report.

Q19. Are you familiar with any research entities that have published guidelines or expert opinions on how to conduct pre-construction acoustic monitoring for wind

development sites?

A19. Yes. The Bats and Wind Energy Cooperative (BWEC) has conducted studies in Pennsylvania (Arnett et al., 2005), Wisconsin (Redell et al., 2006), and Massachusetts (Arnett et al. 2007). The BWEC group always relies on elevated acoustic monitoring to document migratory bat activity. A guidance document published by BWEC (Kunz et al., 2007) and cited several times in the Interim Report, states that pre-construction acoustic monitoring should be conducted for multiple years with sampling in each major habitat. They further state that monitoring should be done above 30 m because ground monitoring does not detect bats at the rotor height. Again, two WEST employees are involved with the BWEC group, and therefore these recommendations should have been well known to WEST; it is unclear why WEST failed to implement guidelines that their own employees have recommended as best scientific practice.

Independent research, including a paper published by one of the Interim Report authors before he began employment with WEST, shows that temporal variation in bat activity in a forested landscape can be accounted for by vertical shifts in bat activity throughout the night. In the conclusion to this research, Gruver states that exclusive use of ground-based equipment can result in an incomplete picture of bat activity (Hayes and Gruver, 2000). Additional, J. Gruver worked with Dr. Robert Barclay, a well-known bat biologist in Canada that has done extensive pre- and post-construction acoustic monitoring using met towers and other elevated sampling platforms. WEST clearly has the expertise to design an appropriate survey protocol but for reasons that were not made clear in the Interim Report, they failed to follow the guidance of their own experts.

Q20. Are you familiar with any federal agencies that have published guidelines or expert opinions on how to conduct pre-construction acoustic monitoring for wind development sites?

A20. Yes. The US Fish and Wildlife Service established a Wind Turbine Guidelines Advisory Committee in 2006. They released a Recommended Guidelines document (the "USFWS Guidelines": USFWS, 2010a) that creates a five tier review process that includes agency consultation (Tier 1), Site Characterization (Tier 2), Field Studies (Tier 3), Post-Construction Fatality Studies (Tier 4), and Impact Mitigation (Tier 5). The Guidelines state that the Site Characterization include documenting the species composition and size classes of canopy trees throughout the project area, including the presence and density of tree snags. For Tier 3 surveys, the Guidelines recommend acoustic monitoring for one full year, collected concurrently with temperature and wind speed data. The number of detectors needed to achieve the desired level of precision will vary depending on within-site habitat variation. Furthermore, the "Committee recommends placing acoustic detectors on existing met towers, approximately every two kilometers across the site where turbines are expected to be sited" (page 37). These detectors "should be placed at high positions" and "near the rotor swept zone". When ground-based detectors are used, the Committee recommends using one or more mobile units to increase coverage of the proposed project site, including potentially high bat use areas within the study area.

Similarly, the Department of the Interior Framework Document (USDOI, 2009) (the "USDOI Framework Document") suggests one full year of pre-construction acoustic monitoring using a met tower. Lastly, the National Research Council published and Environmental Impacts of Wind-Energy Projects document (NRC, 2007) that recommends multi-year pre-construction acoustic monitoring that characterizes the habitat variation and seasonality of bat activity. To my knowledge, there are no federal guidelines that recommend fixed-point ground-based acoustic monitoring as a standard protocol for evaluating bat activity at a wind development site. The Interim Report fails to meet both the USFWS Guidelines and the USDOI Framework Document.

Q21. Are you familiar with any states that have existing standards, guidelines, or expert opinions that the Connecticut Siting Council could cite as protocols that have been used to better characterize the bat activity at the Colebrook project site?

A21. Yes. Several states explicitly rely on the USFWS Guidelines (Oregon, Washington, Montana, New Mexico, North Dakota) or the National Wind Coordinating Committee Siting Handbook (Kansas, South Dakota); most of the remaining states rely on state wildlife agency review. Although most states have not published detailed sampling protocols, I was able to find eight states that have specific guidance documents that detail minimum requirements. None of these states recommends ground-based acoustic monitoring as a primary sampling protocol.

a. New Jersey DEP Guidelines (NJDEP, 2009) recommends the use of three acoustic monitors on each met tower platform.

b. New York DEC Guidelines (NYDEC, 2007) recommends the use of met tower monitoring. When ground-based acoustics are used, they should be for summer monitoring and should be active (hand-held) sampling, not passive fixed monitoring.

c. Pennsylvania Wind Siting Guidelines (PAGC, 2007) were developed in consultation with the BWEC Advisory Committee; the minimum recommendations are for acoustic monitoring using met-tower based monitors for one full year.

d. Vermont ANR Guidelines (VTANR, 2006) recommends two years of pre-construction monitoring with a minimum of two monitoring stations (with at least two detectors per station). Each station should use elevated sampling platforms and monitoring bat activity from April through September.

e. Arizona Wind Guidelines (AGFD, 2008) states that at least one full year of pre-construction monitoring should occur concurrent with the collection of meteorological data using tower-based monitors (no less than 30 m in altitude). The AGFD also requires the developer to identify physical attractants such as riparian areas, water or forage sources, or roosting habitat that could attract or concentrate bats. It further states that sampling should be distributed evenly across the project site and placed in multiple habitats to maximize the ability to collect data.

f. Maine Windpower Advisory Group (Jones, 2006) recommends sampling at elevated platforms for an entire year of bat activity.

g. Maryland Wind Technical Advisory Group Siting Guidelines (Gates et al., 2006) recommends developers conduct one year of monitoring that should be seasonally and spatially appropriate for the project site.

h. California Bat Working Group Survey Protocol for Wind Energy (Hogan, 2006) states that ground-based acoustic monitoring can't adequately assess migratory activity. They recommend two years of pre-construction acoustic monitoring to capture the spatial and temporal variation in bat activity.

The survey protocol conducted at the Colebrook South project site failed to meet the minimum sampling criteria of every state that has published guidelines.

Q22. Do you consider the bat activity documented at the Colebrook site to be typical of other pre-construction acoustic surveys?

I conducted pre-construction (Maple Ridge, Dutch Hill) and post-construction (Ellenburg, Clinton, Bliss, Maple Ridge) acoustic monitoring at several of the locations cited by WEST in Table 4; all of these sites used elevated sampling platforms except the Noble Ellenburg site (which lacked a meteorological tower). Based on identical sampling periods and limiting the comparison to the ground-based microphones, all the projects had lower activity rates (2.3 - 11.90 calls/dn) than the CWRAS site. In addition to these sites, the Buffalo Mountain site also used both ground-based and elevated sampling (Fiedler et al., 2007). WEST claims that "[t]o our knowledge, activity data [presented in Table 4] were collected using ground-based Anabat detectors". However, this is an inaccurate statement. Two projects (Mountaineer, WV and Casselman, PA) are well-known projects sites because they were studied by the Bat and Wind Energy Cooperative, which included two WEST employees. Both of these studies relied almost exclusively on elevated sampling platforms.

Characterizing the overall bat activity at the CWRAS as 'within the range" of other pre-construction surveys when the acoustic monitoring was limited to a single low-activity habitat type, appears not to provide a complete picture of bat activity at the project site. BNE's Petition concludes that:

> *bat fatality patterns observed at facilities within the region in similar forest-dominated landscapes have been low to moderate based on regional study results. If latitudinal, landscape and patterns of bat activity rates relative to fatality rates for the CWRA are consistent with regional study results, predicted fatality rates for bats will be moderate."* (BNE Petition 983, page 25).

It is unclear, however, what the basis is for this statement given that the highest documented bat mortality rates are found in forest-dominated landscapes in the eastern United

States. Although the project site has features that distinguish it from these other sites, none of these features were identified or incorporated into the design of the acoustic monitoring survey. Given that no data have been provided relative to the fall migratory period, when the majority of bat mortality is known to occur, and given that most of the bat activity at the CWRAS project site comes from LF and MF bats (which contains all the migratory bats), and given that the activity rates documented at the CWRAS project site are relatively high compared to other sites in the northeast, the Petition's conclusion is unsubstantiated. In light of the fact that the study outlined in the Interim Report does not meet the minimum pre-construction monitoring guidelines of any research entity or regulatory agency in terms of design or duration, it would appear to be inadequate to characterize the potential impact of wind development on bats at the project site.

Literature Cited:

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Fiedler, J.et al., 2007. Results of bat and bird mortality monitoring at the expanded Buffalo Mountain Windfarm, 2005. Report prepared for the Tennessee Valley Authority, June 28, 2007. 38 pp.

Gates, R. et al. 2006. Siting guidelines to mitigate avian and bat risks from windpower projects. Final recommendations of wind energy Technical Advisory Group. Submitted to the Maryland Public Service Commission June 2006.

Hayes, J.P. and J.C. Gruver, 2000. Vertical stratification of bat activity in an old-growth forest in western Washington. Northwest Science 74: 102-108.

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Hutchinson, J.T. and M.J. Lacki. 2000. Selection of day roosts by red bats in mixed mesophytic forests. Journal of Wildlife Management, 64: 87-94.

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Johnson, G.D. 2005. A review of bat mortality at wind-energy developments in the United States. Bat Research News 46:45-49.

Jones, J. 2006. Methodologies for evaluating bird and bat interactions with wind turbines in Maine. Draft Report prepared by Maine Audubon, Maine Windpower Advisory Group, Maine DIFW, and Wildlife Windpower Siting Committee; April 2006, 27 pp.

Kerlinger, P. and J. Kerns. 2004. A study of bird and bat collision fatalities at the Mountaineer Wind Energy Center, Tucker County, West Virginia: Annual Report for 2003. Technical report prepared for FPL Energy and MWEC Wind Energy Center Technical Review Committee.

Kunz, T.H., E.B. Arnett, W.P. Erickson, G.D. Johnson, R.P. Larkin, M.D. Strickland, R.W. Thresher, and M.D. Tuttle, 2007. Ecological impacts of wind energy development on bats: questions, research needs and hypotheses. Frontiers in Ecology and the Environment, 5: 315-324.

Kurta, A. and H. Rice, 2002. Ecology and management of the Indiana bat in Michigan. Michigan Academician, 34:175-190.

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[NJDEP] New Jersey Department of Environmental Protection, 2009. Technical Manual for Evaluating Wildlife Impacts of Wind Turbines Requiring Coastal Permits. Report dated September 08, 2009, 38 pp.

[NRC] National Research Council, 2007. Environmental Impacts of Wind-Energy Projects. National Academies Press, Washington D.C.

[NYDEC] New York Department of Environmental Conservation, 2007. Guidelines for conducting bird and bat studies at commercial wind energy projects. Draft Report prepared by NYDEC, Dec 2007, 19 pp.

[PAGC] Pennsylvania Game Commission, 2007. Pre and Post-Construction Monitoring of Bat Populations at Industrial Wind Turbines Sites. Report released February, 2007.

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Robbins, L.W. and E.R. Britzke 1999. Discriminating Myotis sodalis from Myotis lucifugus with Anabat - a critique. Bat Research News 40: 75-76.

Tidhar, D., Z. Courage, and J. Gruver. 2010. Bat acoustic studies for the Colebrook Wind Resource Area Litchfield County, Connecticut. Interim Report submitted to BNE Energy, 17 November, 2010.

Timpone, J.C. et al., 2010. Overlap in roosting habits of Indiana bats (Myotis sodalis) and northern bats (*Myotis septentrionalis*). American Midland Naturalist 163: 115-123.

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[USFWS] U.S. Fish and Wildlife Service. 2003. Service interim guidance on avoiding and minimizing wildlife impacts from wind turbines, Letter to Regional Directors, Regions 1-7; released May 13, 2003.

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Waltrous, K. et al., 2006. Predicting minimum habitat characteristics for the Indiana bat in the Champlain Valley. Journal of Wildlife Management 70: 1228-1237.

The statements above are true and accurate to the best of my knowledge.

14 March, 2011
Date

D. Scott Reynolds, Ph.D.

ATTACHMENT

Exhibit 1 CV of D. Scott Reynolds, Ph.D.

EXHIBIT 1

D. Scott Reynolds, Ph.D.
September 2010

WIND INDUSTRY QUALIFICATIONS

North East Ecological Services, LLC

AREAS OF SPECIALIZATION

- Project Risk Assessment Analysis
- Wind Power Bat Impact Surveys
- Expert Witness and Testimony Development

EDUCATION and CERTIFICATIONS

Ph.D., 1999. Physiological Ecology of Temperate Bats, Boston University; Boston, Massachusetts
B.Sc., 1991. Biology with Environmental Science minor, McGill University: Montréal, Quebec Canada.
Certified Senior Ecologist. Board of Professional Certification of the Ecological Society of America

EMPLOYMENT

North East Ecological Services:	Managing Partner: 1998 - present
St. Paul's School:	Faculty (Ecology, Physiology, and Molecular Biology): 2000 - present
Boston University	Visiting Scholar, Department of Biology: 2009 - present
Antioch New England:	Adjunct Faculty, Graduate School of Environmental Science: 1999 – 2005

PROFESSIONAL MEMBERSHIPS

North East Working Group on Bats: 2003 – present
Ecological Society of America: 2004 – present
American Society of Mammalogists: 1992 – present
North American Bat Research Association: 1992 – present

RESEARCH EXPERIENCE

Project Risk Assessment for Bats: (partial list with completed date)

Four Mile Ridge Wind Project (Garrett County, MD): Synergics Energy, LLC (ongoing)
Fisherman's Atlantic City Wind Project (Atlantic County, NJ): Fisherman's Energy (ongoing)
Cape May Wind Project (Cape May County, NJ): US Coast Guard: (2009)
Paulding Wind Project (Paulding County, OH): Crown and Kornell, LLC: (2009)
Colley Wind Project (Sullivan County, PA): Crown and Kornell, LLC: (2009)
Mount Wachusett Wind Project (Worcester County, MA): Jacobs, Edwards, and Kelcey, LLC: (2008)
Locust Ridge II Wind Project (Schuylkill County, PA): Iberdrola Renewables: 2008
Sandy Ridge Wind Project (Centre County, PA): Gamesa Energy, USA: 2007
Cayuga Ridge Wind Project (LaSalle County, IL): PPM Energy, LLC: 2007
Grandview Wind Project (Edgar County, IL): PPM Energy, LLC: 2007
Chugwater Wind Project (Platte County, WY): Community Energy, Inc: 2007
Tarkio Wind Energy Project: Atchinson County, MO): Community Energy, Inc: 2007
Post Oak Wind Project (Shackelford County, TX): Horizon Wind Energy: 2006
Shiloh II Wind Project (Solano County, CA); enXco Development Corporation: 2006
Liberty Gap Wind Project (Pendleton County, WV): US Wind Force, LLC: 2005
Highland New Wind Development (Highland County, VA): Highland New Wind, LLC: 2005
Laurel Hill Wind Project (Lycoming County, PA): Catamount Energy, LLC: 2005
Northwest Reliability Project (Rutland County, VT): VELCO: 2004
Roth Rock Wind Project (Garrett County, MD): Synergics Energy Services, LLC: 2004
East Haven Wind Farm (Essex County, VT): EMDC, LLC: 2004

Post-Construction Bat Inventories and Migratory Surveys: (completed date)

Wethersfield Wind Project (Wyoming County, NY): Noble Environmental Power: (ongoing)
Chateaugauy Wind Project (Clinton County, NY): Noble Environmental Power: (ongoing)
Bear Creek Wind Project (Luzerne County, PA): Babcock & Brown, LLC: (2009)
Ellenburg Wind Project (Clinton County, NY): Noble Environmental Power: (2009)
Maple Ridge Wind Project (Lewis County, NY): Maple Ridge Wind, LLC: 2009
Locust Ridge I Wind Project (Schuylkill County, PA): Iberdrola Wind Energy: 2007

Pre-Construction Bat Inventories and Migratory Surveys: (partial list with completed date)

Port Jersey Wind Project (Hudson County, NJ): Port Authority of NY/NJ (ongoing)
BayShore Regional Wind Project (Monmouth County, NJ): Bayshore Sewage Authority (ongoing)
Ripley-Westfield Wind Project (Chataqua County, NY): Babcock and Brown, LLC: (2009)
Mount Wachusett Wind Project (Worcester County, MA): Jacobs, Edwards, and Kelcey, LLC: (2009)
Dutch Hill Wind Project (Potter County, PA): STK Renewables: (2009)
Hounsfield Wind Project (Jefferson County, NY): Babcock and Brown, LLC: (2009)
Maple Ridge Wind Project (Lewis County, NY): Horizon Wind and NYSERDA: (2009)
Locust Ridge II Wind Project (Schuylkill County, PA): Community Energy: 2007
Sandy Ridge Wind Project (Centre County, PA): Gamesa Energy, USA: 2007
Chestnut Flats Wind Project (Blair County, PA): Gamesa Energy, USA: 2007
Laurel Hill Wind Project (Lycoming County, PA): Catamount Energy, LLC: 2007
Highland New Wind Development (Highland County, VA): 2006
Locust Ridge I Wind Project (Schuykill County, PA): Iberdrola Renewables Energy: 2005
Flat Rock Wind Power (Lewis County, NY): Atlantic Renewables, LLC: 2005
Glebe Mountain Wind Project (Bennington County, VT): Catamount Energy, LLC: 2004

EXPERT WITNESS TESTIMONY

Liberty Gap Wind Project: West Virginia Public Service Commission on behalf of US Wind Force, LLC.
Highland New Wind Project: Virginia State Corporation Commission on behalf of Highland New Wind, LLC.
Highland New Wind Project: Pendleton County Commission on behalf of Highland New Wind, LLC.
Roth Rock Wind Project: Maryland State Corporation Commission on behalf of Synergics Energy, LLC.
East Haven Wind Project: Vermont Public Service Board on behalf of EMDC, LLC.

PROFESSIONAL PRESENTATIONS

Re-evaluating the Role for Banding in the Population Biology of Bats. North American Symposium on Bat Research, Denver, Colorado: 2010.

Banding for WNS Surveillance and Research. White Nose Syndrome Symposium, Pittsburgh, Pennsylvania: 2010.

The Impact of White-Nose Syndrome on the bats of New Hampshire: on the brink of a regional extinction? North American Symposium on Bat Research, Portland, Oregon: 2009

The Impact of White-Nose Syndrome on the bats of New Hampshire. White-Nose Syndrome Symposium, Pittsburgh, Pennsylvania: 2009.

The value of long-term mark-recapture data for determining the population dynamics of the little brown myotis *Myotis lucifugus*. North American Symposium on Bat Research, Scranton, Pennsylvania: 2008.

The potential value of pre-construction surveys for predicting bat fatality at wind facilities: North American Symposium on Bat Research, Merida, Mexico: 2007

Monitoring the potential impact of wind development for bats in the Northeast: North East Bat Working Group, East Stroudsburg, Pennsylvania: 2006.

The use of passive acoustic monitoring as a biological assessment tool for surveying migratory patterns of bats in relation to wind power development: Annual Meeting of the International Ecology Society and the Ecological Society of America, Montréal, Quebec Canada: 2005.

Pre-Construction Assessment of Habitat Use by Bats at the Flat Rock Wind Power Facility, New York: North American Symposium on Bat Research, Salt Lake City, Utah: 2004.

PUBLICATIONS (partial list of most recent or most relevant publications)

Frick, W.F., J. Pollock, A. Hicks, K. Langwig, **D.S. Reynolds**, G. Turner, and T.H. Kunz, 2010. An emerging disease causes regional population collapse of a common North American bat species. Science, 329: 679-682.

Reynolds, D.S. and C. Korine, 2009. Body composition analysis of bats. Pp. 675-691 In: Ecological and Behavioral Methods for the Study of Bats, 2nd Edition (T.H. Kunz & S. Parsons, eds.) Johns Hopkins University Press, Baltimore, MD.

Frick, W.F., **D.S. Reynolds**, and T.H. Kunz, 2009. Influence of climate and reproductive timing on demography of little brown myotis, *Myotis lucifugus*. Journal of Animal Ecology. Online Early 10.111/j.1365-2656.2009.01615.x

Reynolds, D.S., J. Sullivan, and T.H. Kunz. 2009. Evaluation of total body electrical conductivity to estimate body composition of a small mammal. Journal of Wildlife Management, 73: 1197-1206.

Veilleux, J.P., P. R. Moosman, **D.S. Reynolds**, K.E. LaGory, and L.J. Walston, 2009. Observations of summer roosting and foraging behavior of a hoary bat (*Lasiurus cinereus*) in southern New Hampshire. Northeastern Naturalist, 16: 148-152.

Arnett, E.B., M.M.P. Huso, **D. S. Reynolds**, and M. Schirmacher, 2007. Patterns of pre-construction bat activity at a proposed wind facility in northwest Massachusetts. An annual report submitted to the Bats and Wind Energy Cooperative. Bat Conservation International, Austin, Texas.

Reynolds, D.S., 2007. Batting 4000. New Hampshire Wildlife Journal, 20 (2):8-12.

Reynolds, D.S., 2006. Monitoring the potential impact of a wind development site on bats in the Northeast. Journal of Wildlife Management, 70: 1219-1227.

Kunz, T.H. and **D.S. Reynolds**, 2004. Bat colonies in buildings. In: Monitoring Trends in Bat Populations of the U.S. and Territories: Problems and Prospects (T.J. O'Shea & M.A. Bogen, eds.) U.S. Geological Survey, Biological Resources Division, Information and Technology Report, Washington D.C.

CERTIFICATION

I hereby certify that a copy of the foregoing document was delivered by first-class mail and e-mail to the following service list on the 15th day of March, 2011:

Carrie L. Larson
Paul Corey
Jeffery and Mary Stauffer
Thomas D. McKeon
David M. Cusick
Richard T. Roznoy
David R. Lawrence and Jeannie Lemelin
Walter Zima and Brandy L. Grant
Eva Villanova

and sent via e-mail only to:

John R. Morissette
Christopher R. Bernard
Joaquina Borges King

Denise L. Myron