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Executive Director

# New Hampshire Fish and Game Department

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November 5, 2010

Michael J. Iacopino  
Brennan, Caro, Lenehan & Iacopino  
85 Brook Street  
Manchester, NH 03104

RE: Final Report and Recommendations for Groton Wind LLC (SEC #2010-01)

Dear Mr. Iacopino:

Staff from the New Hampshire Fish & Game Department (NHF&G) has had an opportunity to review the Spring and Summer 2010 acoustic bat survey report. The Department found that this study satisfactorily complied with the initial consultation requests to adequately survey for pre-construction bat activity at the proposed Groton Wind Project in Grafton County, New Hampshire. However, there are several gaps of data in assessing bat activity, which are recommended during construction and post-construction should this project be approved.

Based on reviews by Department staff within the Non-game program, the following report is offered:

The acoustic study produced mostly consistent data indicating a relatively low to medium rate of bat detection at four sites within the proposed project area. Two nights of high rates of bat detection appears to be an anomaly and not an indicator of usual presence.

Nevertheless, it is also important to consider that bat species or abundances not detected in the area during pre-construction surveys could be found in significant numbers at a site after construction, generating higher bat mortality rates around turbines than would have been predicted. For example, bat species especially active in forest clearings, patches of natal forest regeneration, and/or along roadsides would be of particular concern because these microhabitats are often created with the establishment of a wind energy facility (Kunz *et al.* 2007b, NAS 2007).

In addition, bat activity at the height of proposed turbines cannot be easily measured, and bat fatalities appear to increase exponentially with the height of the turbine base, indicating that bats concentrate their feeding and/or flight patterns at or above this height when close to wind turbines and blades (Barclay *et al.* 2007). Finally, there is evidence suggesting that bats are attracted towards the turbine bases or blades themselves. This is termed the "attraction hypothesis" and there are multiple possible explanations for this phenomenon (Cryan 2008, Kunz *et al.* 2007b, Horn 2008). For these reasons, the amount of

bat activity recorded in the 2010 acoustic study may be an inaccurate prediction of bat activity at the height of proposed turbines or throughout the site after turbines are operational.

Since the Departments' initial consultation, increased concerns for the severe decline of Northeastern cave bat species, with the little brown bat *Myotis lucifugus* predicted to be regionally extinct by the year 2026 if a treatment for White Nose Syndrome is not found (Frick *et al.* 2010). It is not yet known if the three Eastern migratory bat species, which comprise the majority of bat mortality at Eastern U.S. wind energy sites (Kunz *et al.* 2007b) are affected by White Nose Syndrome. Caution should be used for wind energy sites in New Hampshire, because installation of these facilities may increase the mortality rate overall, and this would be especially detrimental to already declining populations of bats.

Given all of these concerns, measures to thoroughly and accurately document the effect of the Groton wind energy facilities on bat activity and bat mortality are merited. In the event that this project is approved, the Department suggests the following continuation of monitoring bat activity, as well as the addition of documenting wind energy-related bat mortality. Observing these suggestions will advance information on causes for and reduction of bat mortality at wind energy sites.

### **I. Recommended activity surveys**

- i. Continue to perform acoustic surveys of bat activity simultaneously with construction and post-construction (operational) activities at the original four acoustic survey sites. This will help determine if there is a change in bat foraging activity over time during these processes. There is little data available that was generated using a systematic, rigorous protocol to compare species presence and abundance at the same wind energy site between pre- and post-construction years (Kunz *et al.* 2007a). This data is greatly needed.
- ii. It is important to examine rates of bat detection with respect to wind speed and temperature over periods of time shorter than average nightly value, such as per hour. The previous finding that there was no correlation between *mean nightly* environmental conditions and bat detection rate may be based on data collection over too large a range per sampled value to detect bat preferences. Wind speed and temperature are variable over a night, and bats typically engage in "foraging bouts," periods of foraging that are interspersed with periods of roosting and rest over the course of a night. This means that bats may select periods of favorable environmental conditions (such as low wind speed) for foraging, and wind speed at time and location of bat detection would be a more accurate indicator of a correlation. To examine this, temperature and wind speed should be recorded at each monitoring site, at the height found to have the greatest rate of bat activity, such that a significant drop-off in activity, if one occurs, can be detected and compared to wind speed and temperature.
- iii. In addition, there should be an addition of acoustic surveys along access roads, which would create new foraging corridors for several species of New Hampshire bats (NHFG 2010), and may have different amounts of bat activity relative to areas at turbines.

### **II. Recommended mortality surveys**

- i. Implementation of post-construction mortality surveys at the turbines is one of the necessary methods to evaluate the effect of a wind energy facility on bats (Kunz *et al.* 2007a). These surveys should be conducted over multiple years in which turbines are operational and bats are actively moving through and occupying forest areas (generally early spring through October in New Hampshire).

- ii. Studies at multiple wind energy sites have found that slightly increasing the speed at which the blades of wind turbines begin to turn substantially decreases rates of bat mortality (Arnett *et al.* 2008, Arnett *et al.* 2009, Baerwald 2008, Horn 2008). It is therefore highly recommended that the Project compare mortality rates over the course of at least one year of bat activity (spring through fall), between turbines with cut-in wind speeds above the speed at which bats are much less active and turbines with blades set to turn at the regular minimum speed.

In addition, the Department found that the Avian studies satisfactorily complied with the survey recommendations to adequately survey preconstruction bird activity at the proposed project. However, the Department does recommend that the Applicant implement a post-construction bird mortality study designed by its consultants and reviewed and approved by NHF&G. The study should be conducted for three years and a full report should be produced after each complete year.

In the event that the Site Evaluation Subcommittee (SEC) after consultation with NHF&G determines that the project is having an unreasonable adverse impact on any species following the post-construction surveys, that the SEC may take appropriate action within its jurisdiction.

The Department appreciates the opportunity to provide the enclosed information for review by the SEC members on the Groton wind project. If you have any questions or concerns about this information, please do not hesitate to contact me at 271-3511 or by email at: [carol.henderson@wildlife.nh.gov](mailto:carol.henderson@wildlife.nh.gov). Thank you.

Sincerely,



Carol Henderson  
Environmental Review Coordinator

## Literature Cited

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