Exhibit Petitioner AG-2

Fall 2008 Bird and Bat Migration Survey Report

Radar Surveys for the Georgia Mountain Wind Project
In Milton, Vermont

Prepared for

Vermont Environmental Research Associates
1209 Harvey Farm Road
Waterbury Center, VT 05677

Prepared by

Stantec Consulting
30 Park Drive
Topsham, ME 04086

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Executive Summary

During fall 2008, Stantec Consulting (Stantec) conducted field surveys of bird and bat migration activity at the Georgia Mountain Community Wind Project area in Milton, Vermont (Project). The surveys are part of the planning process by Vermont Environmental Research Associates (VERA) for a proposed wind Project, which will include the erection of up to five wind turbines.

The field survey targeted 20 nights of sampling from September 1 to October 15, 2008. A total of 21 nights were sampled. The overall passage rate for the entire survey period was 326 ± 17 targets per kilometer per hour (t/km/hr); nightly passage rates varied from 56 ± 8 t/km/hr to 700 ± 108 t/km/hr. Mean flight direction through the Project area was 230º ± 84º. The mean flight height of targets was 371 meters (m) ± 7 m (1217 feet [‘] ± 23’) above the radar site. The average nightly flight height ranged from 270 m ± 8 m (866’ ± 26’) to 539 m ± 29 m (1768’ ± 95’). The seasonal average percentage of targets observed flying below 120 m (394’), the anticipated height of the turbine with blades attached, was 7 percent, also varying by night from 0 to 17 percent.

Analysis of flight direction and dispersion of targets relative to the surrounding topography indicates that nocturnal migration in the project area can be characterized as “broad-front”, rather than concentrated in narrow corridors or funneled based on topographic features. In addition, migrants traveling perpendicular to the turbine string may experience reduced collision risk. Finally, the flight height of targets indicates that the vast majority of nocturnal migration in the area occurs well above the height of the proposed wind turbines. Based on the observed, broad-front type of migration movement, particularly in conjunction with the high observed flight heights and perpendicular movements of targets across the ridgeline, it’s likely that the potential for nocturnal migrants to collide with proposed turbines during fall migration is minimal.

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1.0 Introduction

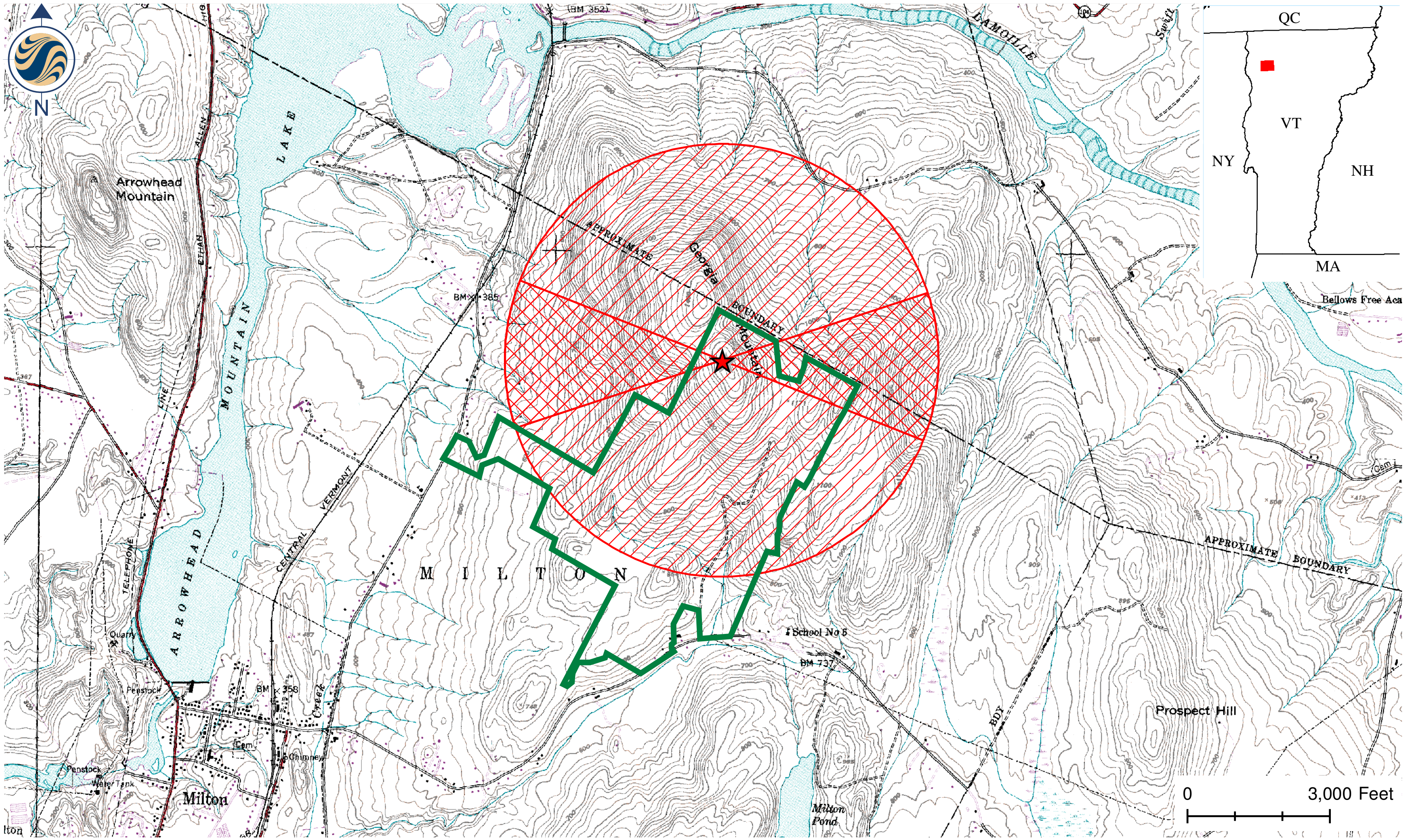
1.1 PROJECT CONTEXT

Vermont Environmental Research Associates (VERA) is the prime environmental contractor for H.W. Venture's proposed Georgia Mountain Community Wind Project in Milton, Vermont (Figure 1-1; Project). In advance of permitting activities for the Project, VERA contracted Stantec Consulting (Stantec) to conduct nocturnal radar surveys to assess nocturnal migration activity of birds and bats in the Project area. Radar surveys provide data to help assess the potential collision risk for the proposed Project to impact birds and bats ("targets"). The scope of this survey was based on a combination of standard methods that have developed within the wind power industry for pre-construction surveys, consultation with the Vermont Agency of Natural Resources (VANR), and is consistent with numerous other studies conducted throughout the Northeast region of the United States. Consultation with VANR was initiated prior to the involvement of Stantec. Discussion between Stantec, VERA, and VANR about the appropriate number of nights required for a Project as small as Georgia Mountain took place early in the survey period (see memo from Adam Gravel, Stantec, September 17, 2008; Appendix A). VANR concluded that the draft Guidelines for the Review and Evaluation of Potential Natural Resources Impacts from Utility-Scale Wind Energy Facilities in Vermont (2006) should be followed, regardless of the limited proposed Project size (see response memo from VANR, September 22, 2008; Appendix A). This report summarizes the methods and results of the radar survey completed within the Project area in fall 2008 and were completed in accordance with the VANR Wind Power Guidelines.

1.2 PROJECT AREA DESCRIPTION

Georgia Mountain lies along the western foothills of the Green Mountains in Chittenden County, Vermont, and is considered part of the Champlain Valley biophysical region. The topography in this region is variable, ranging from 29 meters (m; 95 feet [']) above sea level at the shores of Lake Champlain, to 549 m (1,800') in the Green Mountain foothills (Thompson and Sorenson 2000). The Project area of Georgia Mountain extends from a southern knob with a maximum elevation of approximately 439 m (1440') to the south and west. Directly to the west lies Arrowhead Mountain Lake and further west lies Lake Champlain. To the east, the lower elevation, rolling hills give way to the north-south spine of the Green Mountains.

Habitats on Georgia Mountain are typical of higher elevations in the Champlain Valley biophysical region. The natural community type found within the Project area is dominantly northern hardwood forest, which is also the most dominant community type in Vermont. The most common tree species in the Project area include American beech (*Fagus grandifolia*), yellow birch (*Betula alleghaniensis*), and sugar maple (*Acer saccharum*). Existing hiking and ATV trails and unpaved logging roads are interspersed throughout the area.



195600419

Stantec Consulting Ltd.
30 Park Drive
Topsham, ME USA
04086
Phone (207) 729-1199
Fax: (207) 729-2715
www.stantec.com

Stantec

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Legend

Radar Location
Project Area
Alignment of Vertical Radar Sweep
Horizontal Radar Detection Range

Client/Project
VERA
Gerogia Mountain
Milton, Vermont

Figure No.
1

Title
Radar Location Map
11/17/2008

2.0 Nocturnal Radar Survey

The majority of North American songbirds, or passerines, migrate at night. The strategy to migrate at night may have evolved to take advantage of more stable atmospheric conditions for flapping flight (Kerlinger 1995). Additionally, night migration may provide a more efficient medium to regulate body temperature during active, flapping flight and could reduce the potential for predation while in flight (Alerstam 1990, Kerlinger 1995). Conversely, species, such as raptors, that use soaring flight migrate during the day to take advantage of warm rising air in thermals and laminar flow of air over the landscape, which can create updrafts along hillsides and ridgelines.

While raptor migration can be documented by visual daytime surveys, documenting the patterns of nocturnally migrating birds and bats requires the use of radar or other non-visual technologies. A nocturnal radar survey was conducted in the Project area to characterize fall 2008 nocturnal migration patterns. The goal of the survey was to document the overall passage rates for nocturnal migration in the vicinity of the Project area, including the number of migrants, their flight direction, and their flight altitude.

2.1 METHODS

The radar study was conducted from the meteorological (met) tower site near the center of the Project area (Figure 1-1). This site afforded good sampling of the airspace within 1.4 kilometers (km; approximately 4,500’) of the site and was the most suitable location for radar equipment deployment. Effort was made to maximize the airspace sampled by elevating the antennae to approximately 10 m (32’), thus reducing the amount of the radar beam reflected back by surrounding vegetation.

Marine surveillance radar, similar to that described by Cooper *et al.* (1991), was used during field data collection. The radar has a peak power output of 12 kilowatts (kW) and has the ability to track small animals, including birds, bats, and even insects, based on settings selected for the radar functions. It cannot, however, readily distinguish between different types of animals being detected. Consequently, all animals observed on the radar screen were identified as “targets.” The radar has an “echo trail” function which captures past echoes of flight trails, enabling determination of flight direction. During all operations, the radar’s echo trail was set to 30 seconds. The radar was equipped with a 2 m (6.5’) waveguide antenna. The antenna has a vertical beam width of 20º (10º above and below horizontal). Objects on the ground detected by the radar cause returns on the radar screen (echoes) that appear as blotches called ground clutter. Large amounts of ground clutter reduce the ability of the radar to track birds and bats flying over those areas. However, vegetation and hilltops near the radar can be used to reduce or eliminate ground clutter by “hiding” clutter-causing objects from the radar. These nearby features also cause ground clutter, but their proximity to the radar antenna generally limits the ground clutter to the center of the radar screen (Figure 2-1). The presence or reduction of potential clutter producing objects was carefully considered during site selection and radar station configuration.

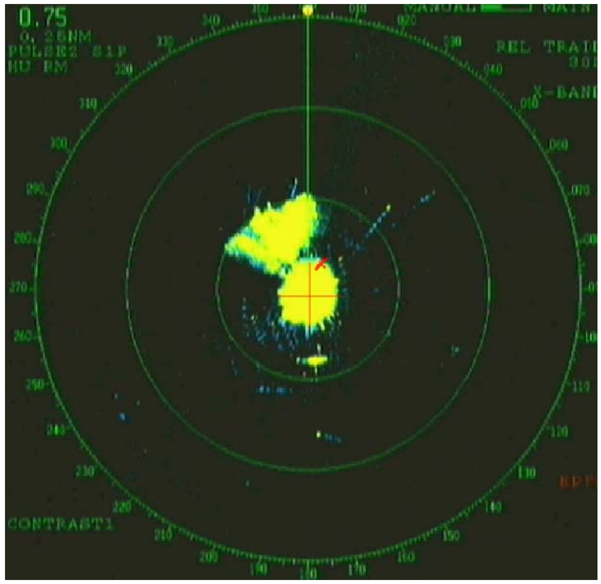

Figure 2-1. Ground clutter in Project area

Radar surveys were conducted from sunset to sunrise, and were scheduled to occur on 20 nights between September 1 and October 15. Because the anti-rain function of the radar must be turned down to detect small songbirds and bats, surveys could not be conducted during periods of inclement weather. Therefore, surveys were planned largely for nights without rain. However, in order to characterize migration patterns during nights without optimal conditions, some nights with weather forecasts including occasional showers were sampled.

The radar was operated in two modes throughout the night. In surveillance mode, the antenna spins horizontally to survey the airspace around the radar and detects the number of targets and their flight direction as they pass through the Project area (Figure 2-2). By analyzing the echo trail, the flight direction of targets can be determined.

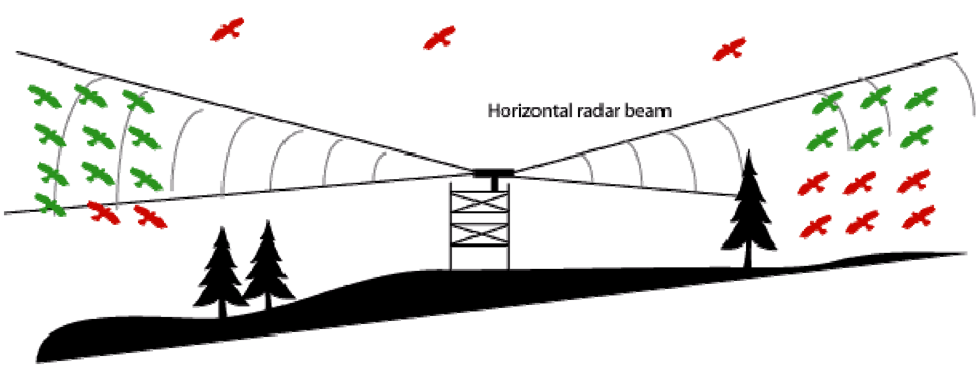

Figure 2-2. Detection range of the radar in surveillance mode (horizontal)

In vertical mode, the radar unit is tilted 90º to vertically survey the airspace above the radar (Harmata *et al.* 1999). In vertical mode, target echoes do not provide directional data, but do provide information on the altitude of targets passing through the vertical, 20º radar beam (Figure 2-3). Both modes of operation were used during each hour of sampling.

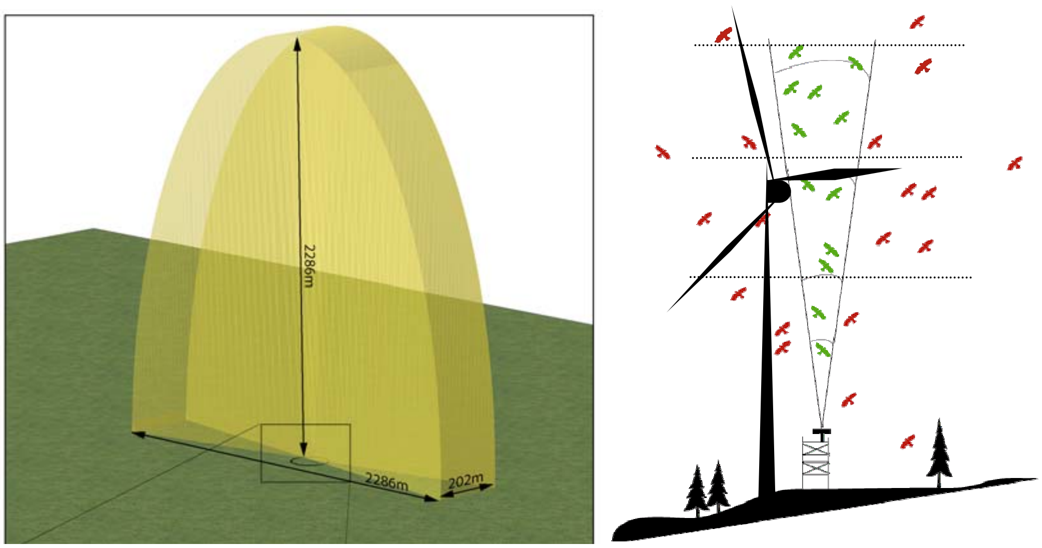

Figure 2-3. Detection range of the radar in vertical mode

The radar was operated at a range of 1.4 km (approximately 4500'). At this range, the echoes of small birds can be easily detected, observed, and tracked. At greater ranges, larger birds can be detected but the echoes of small birds are reduced in size and restricted to a smaller portion of the radar screen, thus limiting the ability to observe the movement pattern of individual targets.

2.1.1 Data Collection

The radar display was connected to the video recording software of a computer enabling digital archiving of the radar data for subsequent analysis. This software recorded and archived video samples continuously every hour from sunset to sunrise of each survey night. By alternating the radar antenna every ten minutes from vertical mode to horizontal mode, a total of 30 minutes of vertical samples and 30 minutes of horizontal samples were collected within each hour. Video recordings were subsequently analyzed based on a random schedule for each night. This analysis schedule allowed for randomization of sample selection for post processing and prevented double-counting of targets due to the 30-second echo trail used to determine the flight path vector.

2.1.2 Data Analysis

Video samples were analyzed using a digital analysis software tool developed by Stantec. For horizontal samples, targets (either birds or bats) were differentiated from insects based on their flight speed. Following adjustment for wind speed and direction, targets traveling faster than approximately 6 m (20') per second were identified as a bird or bat target (Larkin 1991, Bruderer and Boldt 2001). The software tool recorded the time, location, and flight vector for each target traveling fast enough to be a bird or bat within each horizontal sample, and these results were output to a spreadsheet. For vertical samples, the software tool recorded the entry point of targets passing through the vertical radar beam, the time, and flight altitude above the radar location, and then subsequently output the data to a spreadsheet. These datasets were then used to calculate passage rate (reported as targets per kilometer of migratory front per hour), flight direction, and flight altitude of targets.

Mean target flight directions (± 1 circular standard deviation) were summarized using software designed specifically to analyze directional data (Oriana2© Kovach Computing Services). The statistics used for this analysis are based on those used by Batschelet (1965), because they take into account the circular nature of the data. Nightly wind direction was also summarized using similar methods and data, which was collected from the met tower nearest to the radar.

Flight altitude data were summarized using linear statistics. Mean flight altitudes (± 1 standard error [SE]) were calculated by hour, night, and overall season. The percent of targets flying below 120 m, the approximate maximum height of the proposed wind turbines with blades, was also calculated hourly, for each night, and for the entire survey period.

2.1.3 Weather Data

Temperature, wind speed, and wind direction were recorded for the duration of the survey period at 10-minute intervals by an on site met tower for the duration of the radar survey period. The mean, maximum, and minimum temperature, wind speed, and wind direction were calculated for each night.

2.2 RESULTS

Radar surveys were conducted during 21 nights between September 10 and October 7, 2008 (Appendix B, Table 1). The radar view was only slightly impeded by the northwest knob of Georgia Mountain (Figure 1-1). By elevating the radar 10 m above the ground and using the forest canopy immediately surrounding the radar to block interference at greater distances, the knob to the east of the radar site was completely masked and therefore did not show up as ground clutter (Figure 2-4).

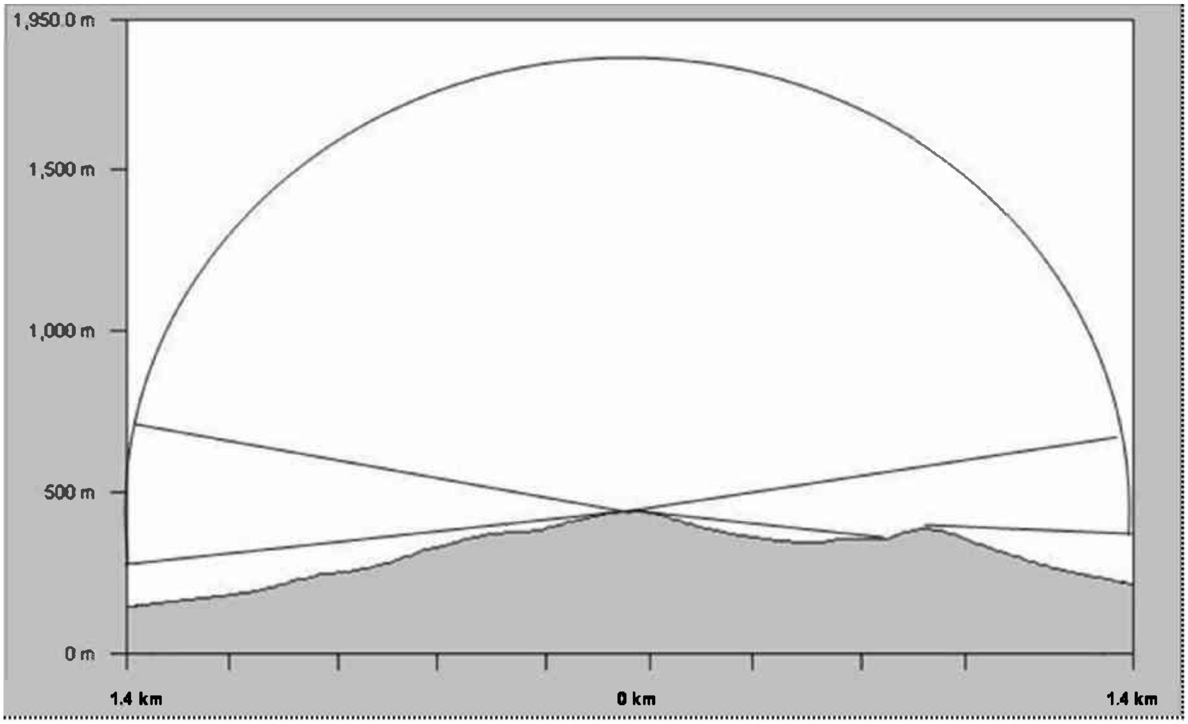

Figure 2-4. Cross-section of Georgia Mountain, looking due north, showing theoretical range of radar in horizontal mode (wedges), and vertical mode (circle). The knob to the east did not impede the radar view due to radar elevation and local tree canopy.

2.2.1 Passage Rates

Nightly passage rates varied from 56 targets per kilometer per hour (t/km/hr) on September 12, 2008 to 700 t/km/h on September 21, 2008, and the overall passage rate for the entire survey period was 326 t/km/hr (Figure 2-5; also Appendix B, Table 1). For the entire season, passage rates were highest 2-3 hours past sunset and gradually declined through sunrise (Figure 2-6). Passage rates varied greatly between nights during the season, indicating migration occurred in pulses, with rates of migration likely influenced by weather patterns and conditions from night to night (Appendix B, Table 1).

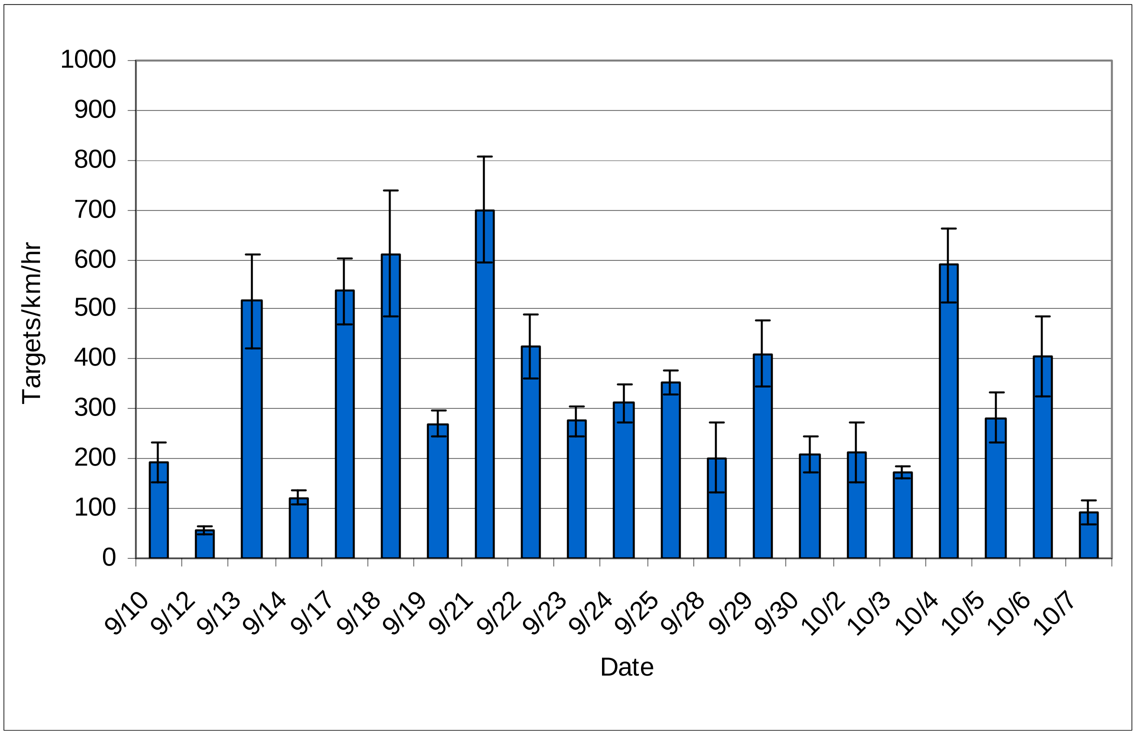

Figure 2-5. Nightly passage rates observed (error bars ± 1 SE)

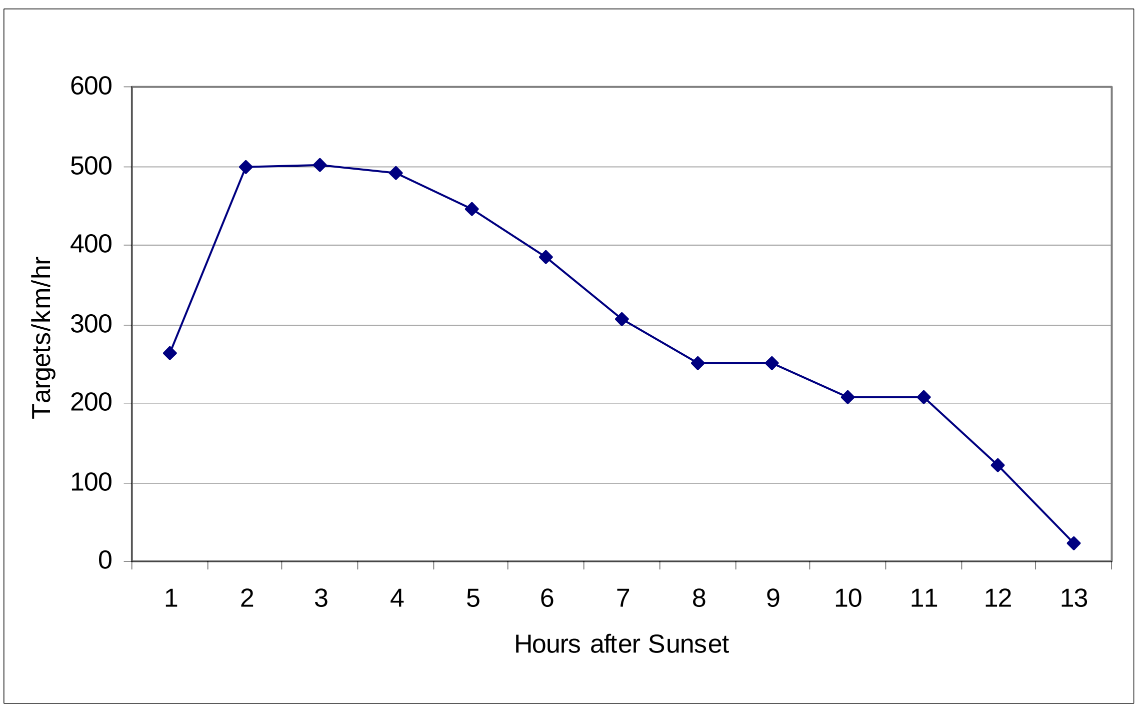

Figure 2-6. Hourly passage rates for entire season

2.2.2 Flight Direction

Mean flight direction through the Project area was 230° ± 84° (Figure 2-7, Appendix B, Table 2). Flight direction was consistently southwestward, roughly perpendicular to the ridgeline of Georgia Mountain. Although some variation in mean flight direction was observed between nights, little variation occurred within nights with high passage rates. For example, on nights with higher passage rates (9/13, 9/17, 9/18, 9/21, and 10/4) observed flight directions were consistently in a southwesterly direction for most hours. Conversely, flight directions were more variable on nights with low passage rates (e.g., 9/12, 9/14, 9/28, 10/3, and10/7).

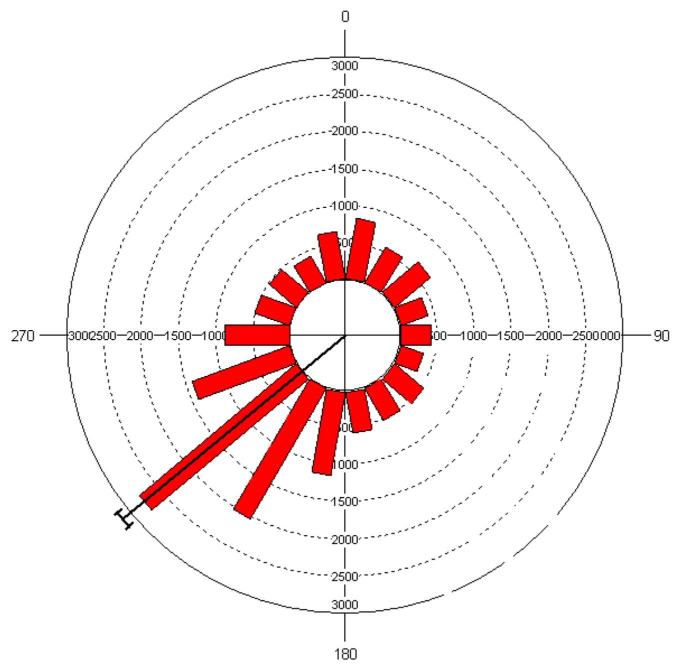

Figure 2-7. Mean flight direction for the entire season (the bracket along the margin of the histogram is the 95% confidence interval)

2.2.3 Flight Altitude

The seasonal average flight height of all targets was 371 m ± 7 m (1217' ± 23') above the radar site. Average nightly flight height ranged from 270 m ± 8 m (886' ± 26') on September 14, 2008 to 539 m ± 29 m (1768' ± 95') on October 7, 2008 (Figure 2-8, Appendix B, Table 3). The percent of targets observed flying below 120 m (394') ranged from 0 percent on October 7, 2008 to 17 percent on September 12, 2008 (Figure 2-9). Within an average night, flight height increased 1-2 hours after sunset and remained generally stable throughout the remainder of the night (Figure 2-10).

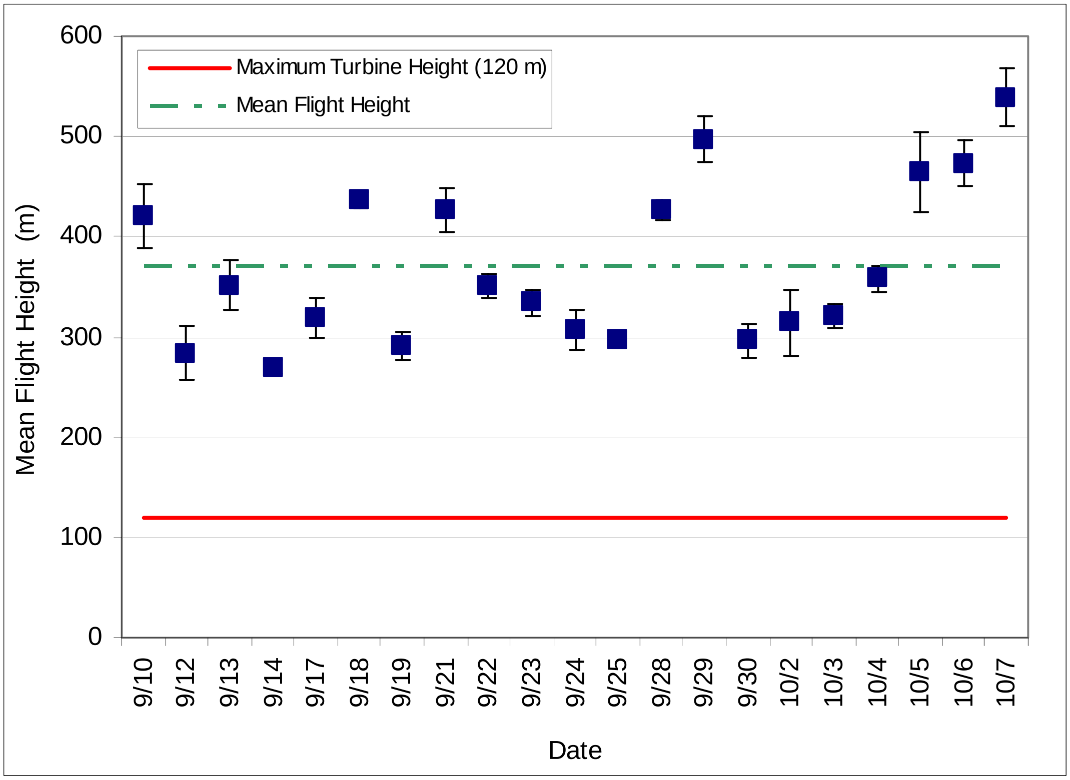

Figure 2-8. Mean nightly flight height of targets (error bars ± 1 SE)

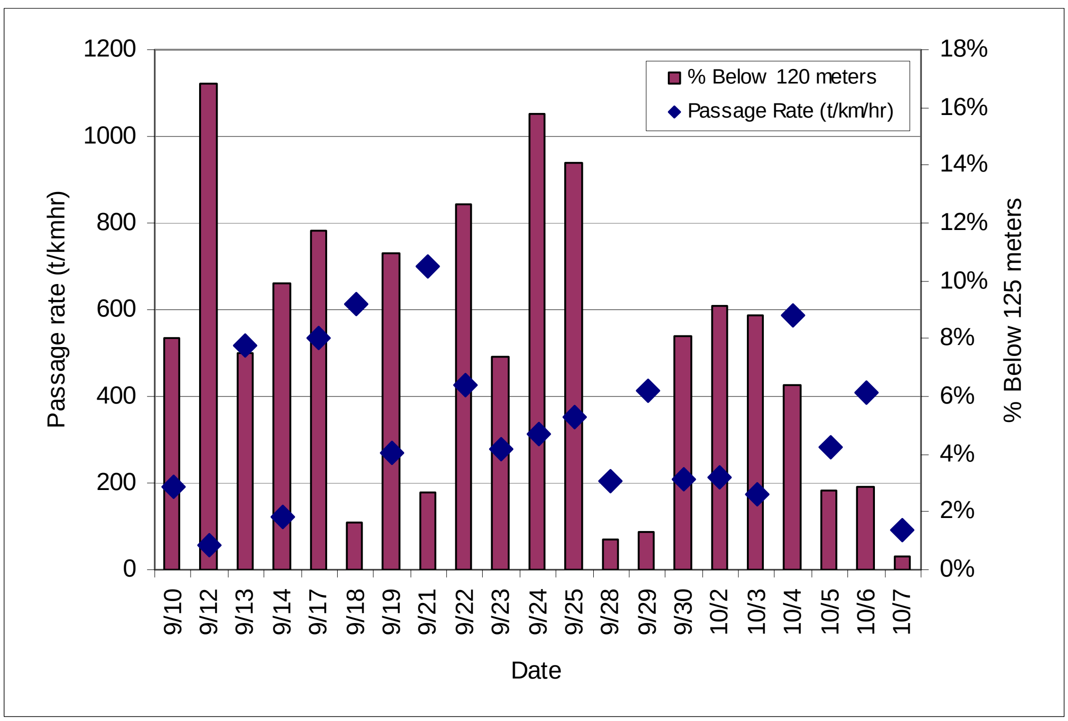

Figure 2-9. Percent of targets observed flying below a height of 120 m (394')

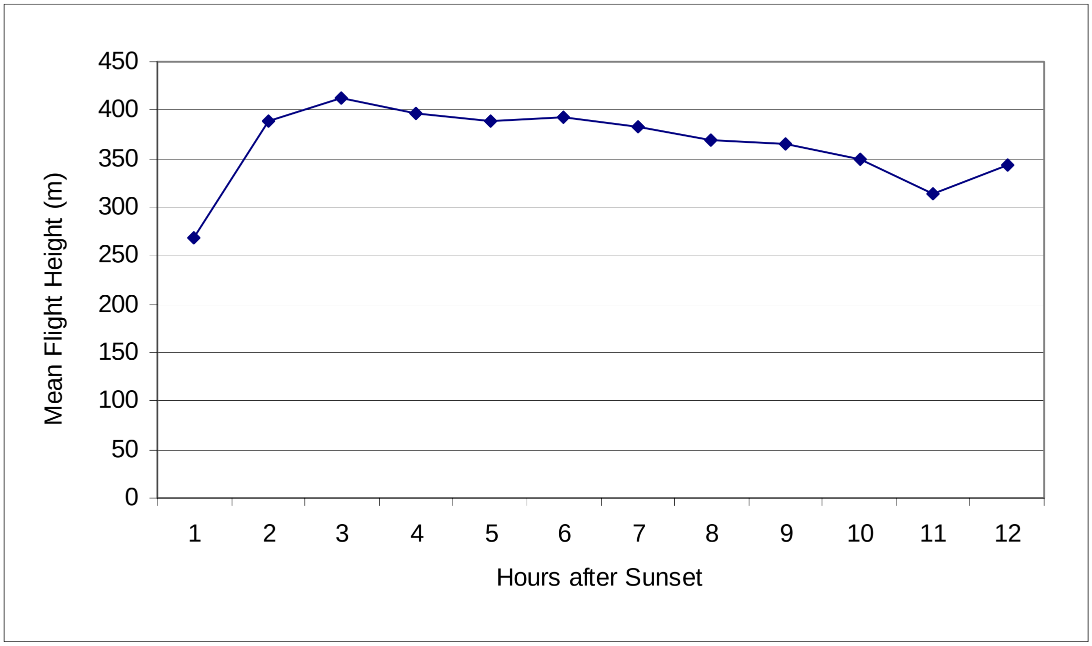

Figure 2-10. Hourly target flight height distribution

Passage rates and flight heights, when considered together; help demonstrate the distribution of nocturnal migrants within the air space throughout the migration season. Figure 2-11 portrays vertical distribution of targets as a box and whisker plot, showing values for the miminum, 25% percentile (bottom of box), median (line in center of box), 75% percentile (top of box), and maximum flight height for each night. Mean nightly flight height and passage rate are also indicated as lines. This figure indicates that the majority of targets passed over Georgia Mountain between the heights of 200 and 600 m, although some targets are as high as 1300 m and others are horizontal or even below the level of the radar site, flying over the valleys on either side of the ridgeline.

Nights with a high percentage of targets flying below maximum turbine height often have low nightly passage rates. These nights are typically characterized by poor-weather conditions unfavorable to migration. During the fall 2008 survey, September 12 had the largest proportion of targets flying below turbine height (17%), but also had the lowest observed passage rates for the entire fall season (56 t/km/hr).

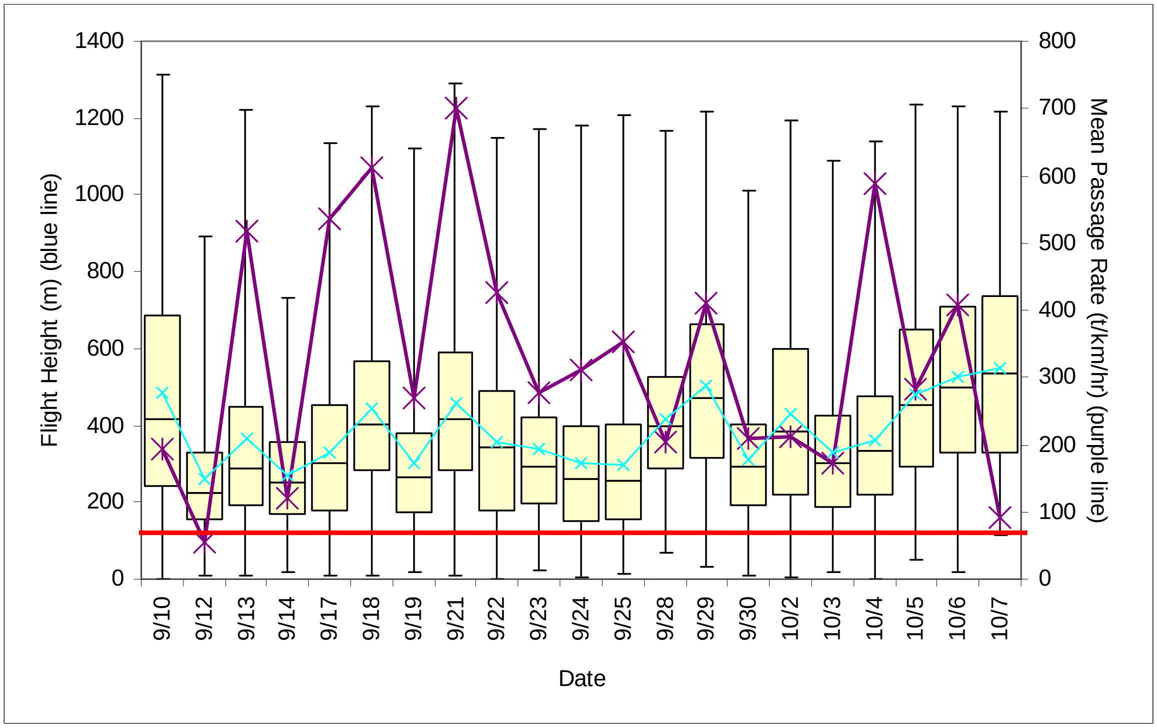

Figure 2-11. Box and whisker plot of flight height showing minimum, 25% percentile, median, 75% percentile, maximum nightly flight height, mean nightly flight height, and mean nightly passage rate. The maximum height of proposed turbines is indicated by the horizontal red line.

2.2.4 Weather Data

Mean nightly wind speeds in the Project area from September 10 to October 7 varied between 2 and 17 meters per second (m/s; 7 to 56' per second), and mean nightly temperatures varied between 4º C and 23º C. Wind direction was variable both within and between nights, but tended to be primarily from the west/northwest over the course of the season. September was a relatively dry month, with a monthly total of 3 centimeters (cm; 1.20 inches ["]) of rain; in contrast, a total of 2.7 cm (1.05") of rain fell in the first seven days of October. Of the 21 nights surveyed, rain showers occurred during 5 nights.

2.3 DISCUSSION

Fall radar surveys at Georgia Mountain documented patterns in nocturnal migration similar to those documented at most recent fall radar surveys in the northeast. These include highly variable passage rates between nights, a generally southward flight direction, and flight heights primarily occurring between 200 and 600 m above the ridge. Within nights, migration activity was highest 2-3 hours after sunset and declined steadily through the end of the night, whereas flight heights were generally stable after the first 1-2 hours of the survey.

Currently, there is no reliable way to distinguish birds from bats during radar data analysis, so results refer only to "targets." Given that the number of potential bird species migrating across the project area far outweighs the nine species of bats known to occur in Vermont, it is likely that the pool of observed targets is composed of a higher percentage of birds than bats. Therefore, results are discussed here primarily in the context of bird migration.

Nightly variation in the magnitude and flight characteristics of nocturnally-migrating songbirds is not uncommon and is often attributed to weather patterns, such as cold fronts and winds aloft (Hassler *et al.* 1963, Gauthreaux and Able 1970, Richardson 1972, Able 1973, Bingman *et al.* 1982, Gauthreaux 1991). Within the fall radar survey at Georgia Mountain, passage rates were highly variable, ranging from 56 to 700 t/km/hr. Because the radar site remained in the same configuration throughout the fall survey, this variability indicates that nocturnal migration was pulsed, presumably related to seasonal timing and regional weather conditions. Large migration events are generally thought to occur on mild nights with calm winds or winds from a favorable direction for fall migration. During fall radar surveys, some of the highest passage rates occurred on nights when winds were from the north-northeast and flight directions were similar, providing a tailwind for nocturnal migrants. Flight patterns were also more erratic on nights with headwinds or crosswinds, with variable flight directions, lower passage rates, and slightly lower flight heights.

Data from regional surveys using similar methods and equipment conducted within the last several years are rapidly becoming available (Appendix B, Table 4). These other studies provide an opportunity to compare the results from Georgia Mountain to other projects in the region. Comparison of passage rates between radar surveys at Georgia Mountain and similar surveys conducted at other sites must be done with caution, as differences in passage rates could be due, in large part, to differences in radar view between sites; in particular, the topography, local landscape conditions, and vegetation surrounding a radar survey location can dramatically influence the ability of any radar unit to detect targets and the subsequent calculation of passage rate. These differences should be recognized as one of the more significant limiting factors in making direct site-to-site comparisons in passage rates. In addition, year-to-year variation in species population size and weather conditions may also contribute to a variation in passage rates.

The emerging body of studies characterizing nocturnal migration shows a relatively consistent pattern in flight altitude, with most birds appearing to fly at altitudes of several hundred meters or more above the ground (Appendix B, Table 4). Comparison of flight height between survey sites as measured by radar is generally less influenced by site characteristics, as the main portion of the radar beam is directed skyward and the potential effects of surrounding vegetation on the radar’s view can be more easily controlled.

While remaining mindful of potential comparison pitfalls, it can be useful to put radar survey results in context with other studies. Both nightly and seasonal passage rates and flight heights recorded at Georgia Mountain fall in the middle of the range of values observed at other studies in the area (Appendix B, Table 4).

VANR expressed concern for the potential of migrants to follow the Lake Champlain Valley, potentially resulting in the concentration of migrants to that area or the funneling of migrants across the Project area as they travel to the valley. Some research suggests that bird migration may be affected by landscape features, such as coastlines, large river valleys, and mountain ranges. This has been documented for diurnally migrating birds, such as raptors, but is not as well established for nocturnally migrating birds (Sielman *et al*. 1981; Bingman 1980; Bingman *et al*. 1982; Bruderer and Jenni 1990; Richardson 1998; Fortin *et al*. 1999; Williams *et al.* 2001; Diehl *et al*. 2003). However, studies suggesting that night-migrating birds are influenced by topography have typically been conducted in areas of steep and abrupt topography, such as the most rugged areas of the northern Appalachians and the Alps; in other words, areas unlike the low-elevation foothills of the Green Mountains.

No evidence of funneled migration was observed during the fall 2008 radar survey. Targets were observed in all areas of the radar detection range and were evenly distributed around the radar, indicating that concentration to any one part of the Project area was not occurring. Furthermore, targets that are concentrated by topography are often observed to fly at lower altitudes, but flight heights at Georgia Mountain were not lower than expected. Finally, average target direction was roughly perpendicular to the ridgeline, indicating that migrants are unlikely to be concentrating along the waterways surrounding the Project area.

2.4 CONCLUSIONS

Fall radar surveys at Georgia Mountain documented patterns in nocturnal migration similar to those documented at most recent fall radar surveys in the northeast. These include highly variable passage rates between nights, a generally southward flight direction, and mean flight heights between 200 and 600 m above the ridge. As a result, we would expect post-construction impacts to be low and generally similar to other Projects in the region.

Analysis of flight direction and dispersion of targets relative to the surrounding topography indicates that nocturnal migration in the project area can be characterized as “broad-front”, rather than concentrated in narrow corridors or funneled based on topographic features. In addition, migrants traveling perpendicular to the turbine string may experience reduced collision risk. Finally, the flight height of targets indicates that the vast majority of nocturnal migration in the area occurs well above the height of the proposed wind turbines. This type of broad-front movement, particularly in conjunction with the high observed flight heights and perpendicular movements of targets across the ridgeline, suggests a limited and minimal potential for nocturnal migrants to collide with proposed turbines during fall migration.

3.0 Literature Cited

Able, K.P. 1973. The role of weather variables and flight direction in determining the magnitude of nocturnal migration. Ecology 54(5):1031–1041.

Alerstam, T. 1990. Bird Migration. Cambridge University Press, Cambridge, United Kingdom.

Batschelet, E. 1965. Statistical Methods for the Analysis of Problems in Animal Orientation and Certain Biological Rhythms. AIBS Monograph. American Institute of Biological Sciences. Washington, DC.

Bingman V.P. 1980. Inland morning flight behavior of nocturnal passerine migrants in Eastern New York. Auk 97:465–72.

Bingman, V.P., K.P. Able, and P. Kerlinger. 1982. Wind drift, compensation, and the use of landmarks by nocturnal bird migrants. Animal Behavior 30:49–53.

Bruderer, B., and A. Boldt. 2001. Flight characteristics of birds: I. Radar measurements of speeds. Ibis. 143:178–204.

Bruderer, B., and L. Jenni. 1990. Migration across the Alps. In Bird Migration: Physiology and Ecophysiology (E. Gwinner, Ed.). Springer Verlag, Berlin.

Cooper, B.A., R.H. Day, R.J. Ritchie, and C.L. Cranor. 1991. An improved marine radar system for studies of bird migration. Journal of Field Ornithology 62:367–377.

Cooper, B.A., and T.J. Mabee. 2000. Bird migration near proposed wind turbine sites at Wethersfield and Harrisburg, New York. Unpublished report prepared for Niagara–Mohawk Power Corporation, Syracuse, NY, by ABR, Inc., Forest Grove, OR. 46 pp.

Cooper, B.A., T.J. Mabee, and J.H. Plissner. 2004b. A Radar Study of Nocturnal Bird Migration at a Proposed Mount Storm wind power development, West Virginia, Fall 2003. Appendix in Avian baseline studies Mount Storm wind power project Grant County, West Virginia, final report 2004. Prepared for NedPower Mount Storm, LLC.

Cooper, B.A., A.A. Stickney, and T.J. Mabee. 2004c. A radar study of nocturnal bird migration at the proposed Chautauqua wind energy facility, New York, Fall 2003.

Diehl, R., R. Larkin, and J. Black. 2003. Radar observations of bird migration over the Great Lakes. The Auk 120(2):278–290.

EchoTrack Inc. 2008. Pre-Construction Bat and Nocturnal Migrant Bird Monitoring Report – Wolfe Island Wind Project, Ontario, Canada, Fall 2007. Prepared for Canadian Renewable Energy Corporation.

Environmental Design and Research. 2006a Draft Environmental Impact Statement for the Dairy Hills Wind Farm Project. Towns of Perry, Warsaw and Covington, Wyoming County, New York. Prepared for Dairy Hills Wind Farm, LLC.

Fortin, D., F. Liechti, and B. Bruderer. 1999. Variation in the nocturnal flight behaviour of migratory birds along the northwest coast of the Mediterranean Sea. Ibis 141:480–488.

Gauthreaux, S.A., Jr. 1991. The flight behavior of migrating birds in changing wind fields: radar and visual analyses. American Zoologist 31:187–204.

Gauthreaux, S.A., Jr., and K.P. Able. 1970. Wind and the direction of nocturnal songbird migration. Nature 228:476–477.

Harmata, A., K. Podruzny, J. Zelenak, and M. Morrison. 1999. Using marine surveillance radar to study bird movements and impact assessment. Wildlife Society Bulletin 27(1):44–52.

Hassler, S.S., R.R. Graber, and F.C. Bellrose. 1963. Fall migration and weather, a radar study. The Wilson Bulletin 75(1):56–77.

Kerlinger, P. 1995. How Birds Migrate. Stackpole Books. Mechanicsburg, PA.

Larkin, R.P. 1991. Flight speeds observed with radar, a correction: slow “birds” are insects. Behavioral Ecology and Sociobiology. 29:221–224.

Mabee, T.J., J.H. Plissner, and B.A. Cooper. 2005a. A radar and visual study of nocturnal bird and bat migration at the proposed Prattsburg-Italy wind power project, New York, fall 2004. Unpublished report prepared for Ecogen LLC, West Seneca, NY, by ABR, Inc., Forest Grove, OR. 26 pp.

Mabee, T.J., J.H. Plissner, and B.A. Cooper. 2006a. A Radar and Visual Study of Nocturnal Bird and Bat Migration at the Proposed Clinton County Windparks, New York, Spring and fall 2005. Report prepared for Ecology and Environment, LLC and Noble Environmental Power, LLC. January 2006.

_____. 2006c. A Radar and Visual Study of Nocturnal Bird and Bat Migration at the Proposed Centerville and Wethersfield Windparks, New York, Fall 2006. Report prepared for Ecology and Environment, LLC and Noble Environmental Power, LLC. December 2006.

Richardson, W.J. 1998. Bird migration and wind turbines: migration timing, flight behavior, and collision risk. Proceedings: National Avian-Wind Power Planning Meeting III, sponsored by Avian Workgroup of the National Wind Coordinating Committee, June 2000.

Richardson, W.J. 1972. Autumn migration and weather in eastern Canada: a radar study. American Birds 26(1):10–16.

Sielman, M., L. Sheriff, and T. Williams. 1981. Nocturnal Migration at Hawk Mountain, Pennsylvania. American Birds 35(6):906–909.

Stantec Consulting. 2007b. Fall 2007 Radar, Visual, and Acoustic Survey of Bird and Bat Migration at the Proposed Windpark in Coos County, New Hampshire by Granite Reliable Power, LLC. Prepared for Granite Reliable Power, LLC.

Thompson, E. H., and E.R. Sorenson. 2000. Wetland, woodland, wildland: a guide to the natural communities of Vermont. The Nature Conservancy and the Vermont Department of Fish and Wildlife, Hanover, NH.

Vermont Agency of Natural Resources (VANR). 2006. Guidelines for the Review and Evaluation of Potential Natural Resources Impacts from Utility-Scale Wind Energy Facilities in Vermont. Vermont Agency of Natural Resources, Waterbury, VT.

Williams T, J. Williams, G. Williams, and P. Stokstad. 2001. Bird Migration Through a Mountain Pass Studied with High Resolution Radar, Ceilometers, and Census. The Auk118(2):389–403.

Western EcoSystems Technology, Inc. (WEST). 2007. Avian and Bat Studies for the Proposed Cape Vincent Wind Power Project, Jefferson County, NY. Prepared for BP Alternative Energy North America.

Woodlot Alternatives, Inc. 2005a. A Radar and Acoustic Survey of Bird and Bat Migration at the Proposed Liberty Gap Wind Project in Franklin, West Virginia – Fall 2004. Prepared for US Wind Force, LLC.

_____. 2005b. A Fall 2004 Radar, Visual, and Acoustic Survey of Bird and Bat Migration at the Proposed Windfarm Prattsburgh Project in Prattsburgh, New York. Prepared for UPC Wind Management, LLC.

_____. 2005c. Fall 2004 Avian Migration Surveys at the Proposed Deerfield Wind/Searsburg Expansion Project in Searsburg and Readsboro, Vermont. Prepared for Deerfield Wind, LLC and Vermont Environmental Research Associates.

_____. 2005l. A Fall 2005 Radar, Visual, and Acoustic Survey of Bird and Bat Migration at the Proposed Marble River Wind Project in Clinton and Ellenburg, New York. Prepared for AES Corporation.

_____. 2005m. A Fall 2005 Radar, Visual, and Acoustic Survey of Bird and Bat Migration at the Proposed Clayton Wind Project in Clayton, New York. Prepared for PPM Atlantic Renewable.

_____. 2005n. A Fall 2005 Radar, Visual, and Acoustic Survey of Bird and Bat Migration at the Proposed High Sheldon Wind Project in Sheldon, New York. Prepared for Invenergy.

_____. 2005o. A Fall 2005 Survey of Bird and Bat Migration at the Proposed Howard Wind Power Project in Howard, New York. Prepared for Everpower Global.

_____. 2005p. A Fall 2005 Radar Survey of Bird and Bat Migration at the Proposed Top Notch Wind Project in Fairfield, New York. Prepared for PPM Atlantic Renewable.

_____. 2005q. A Fall 2005 Radar and Acoustic Survey of Bird and Bat Migration at the Proposed Jordanville Wind Project in Jordanville, New York. Prepared for Community Energy, Inc.

_____. 2005r. Summer and Fall 2005 Bird and Bat Surveys at the Proposed Munnsville Wind Project in Munnsville, New York. Prepared for AES-EHN NY Wind, LLC.

_____. 2005s. A Fall 2005 Radar and Acoustic Survey of Bird and Bat Migration at the Proposed Deerfield Wind Project in Searsburg and Readsboro, Vermont. Prepared for Deerfield Wind LLC and Vermont Environmental Research Associates.

_____. 2005t. A Fall 2005 Radar, Visual, and Acoustic Survey of Bird and Bat Migration at the Proposed Mars Hill Wind Project in Mars Hill, Maine. Prepared for UPC Wind Management, LLC.

_____. 2006a. Avian and Bat Information Summary and Risk Assessment for the Proposed Sheffield Wind Power Project in Sheffield, Vermont. Prepared for UPC Wind Management, LLC.

_____. 2006d. A Fall 2005 Radar Survey of Bird and Bat Migration at the Proposed Kibby Wind Power Project in Kibby and Skinner Townships, Maine. Prepared for TRC and TransCanada Energy, Ltd.

_____. 2006j. A Fall 2006 Survey of Bird and Bat Migration at the Proposed Chateaugay Windpark in Chateaugay, New York. Prepared for Ecology and Environment, Inc. and Noble Power, LLC.

_____. 2007a. A Fall 2006 Survey of Bird and Bat Migration at the Proposed Lempster Mountain Wind Power Project in Lempster, New Hampshire. Prepared for Lempster Wind, LLC.

_____. 2007b. A Fall 2006 Survey of Bird and Bat Migration at the Proposed Stetson Mountain Wind Power Project in Washington County, Maine. Prepared for Evergreen Wind V, LLC.

_____. 2007f. A Fall 2007 Radar, Visual, and Acoustic Survey of Bird and Bat Migration at the Proposed Laurel Mountain Wind Energy Project near Elkins, West Virginia. Prepared for AES Laurel Mountain, LLC.

Young, D.P. 2006. Wildlife Issue Solutions: What Have Marine Radar Surveys Taught Us About Wildlife Risk Assessment? Presented at Windpower 2006 Conference and Exhibition. June 4-7, 2006. Pittsburgh, PA.

Young, D.P., C.S. Nations, V.K. Poulton, J. Kerns, and L. Pavilonis, 2006. Avian and bat studies for the Proposed Dairy Hills wind project, Wyoming County, New York. Prepared for Horizon Wind Energy, April 2006, Cited in the Draft Environmental Impact Statement for the Noble Wethersfield Windpark, Wyoming County, New York. Prepared for Noble Wethersfield Windpark, LLC by Ecology and Environment.

Appendix A

Agency Correspondence

MacDonald, Lisa

From: Gravel, Adam
Sent: Thursday, September 18, 2008 11:33 AM
To: Watrous, Kristen
Subject: FW: 10 Night Survey Discussion

From: Gravel, Adam [mailto:adam.gravel@stantec.com]
Sent: Wednesday, September 17, 2008 6:02 PM
To: Martha Staskus
Cc: Kimberly Hermann
Subject: 10 Night Survey Discussion

Hi Martha,

I am writing this e-mail to discuss why Stantec believes that 10 nights of radar survey data collection is sufficient for the fall 2008 surveys at Georgia Mountain, in Milton Vermont. Because the proposed project only consists of 2-4 wind turbines on a low elevation ridge (max height of 1400 feet) it may not be appropriate for that project to have to conduct as many survey nights as a project of a much larger size and in higher elevations as currently seen proposed by other projects in Vermont. The size of the Georgia Mountain project relative to the other projects in Vermont is what has provoked the discussion of a reduced effort in radar surveys, but project scale alone is not reason enough to decrease the effort. The following outlines our thoughts on why we think that 10 nights of surveys may be acceptable for a small project such as this one and still provide very valuable and comparable data to other projects.

Stantec has conducted over 130 seasons of radar surveys throughout the northeast over the past four years. During this time Stantec has had the opportunity to work with large radar data sets from a variety of locations and has also had the opportunity to re-analyze some of the data to see how many survey nights is scientifically acceptable at a given site. This analysis included a comparison of results from a full 20 night survey (which is what VANR typically recommends) and the results of those same surveys with effort reduced by half. For example, the following is a brief analysis of the fall and spring radar survey results from two 20 night seasons (Spring and Fall) of radar surveys conducted by Stantec for the proposed UPC project in Sheffield Vermont. The purpose of this re-analysis is to see how similar the season results are to a randomly selected 10 night sample of the total 20 nights of surveys conducted at the site (each season). Radar surveys were conducted at the Sheffield Wind Project in the fall 2004 and spring 2005. The following summarizes the results of both seasons of data and re-analysis for 10 randomly selected nights within each of the 20 night surveys seasons at the Sheffield Project.

Season Mean Passage Rates (fall 2004)

20 Nights = 91
10 Nights = 101

Season Mean Flight heights (fall 2004)

20 Nights = 566
10 Nights = 574

Season Mean Passage Rates (Spring 2005)

20 Nights = 166
10 Nights = 193

Season Mean Flight heights (Spring 2005)

20 Nights = 522
10 Nights = 547

Season Mean Flight direction (Spring 2005)

20 Nights = 40
10 Nights = 37

The re-analysis of radar data collected at the Sheffield Wind Project shows that the season means from 20 nights of survey compared to 10 nights is very similar. However, it is important to note that, if only targeting 10 nights of sampling at any given site it must be sampled during the right time period within a migration season. This means that sampling should occur within peak migration periods for the region as observed during our past studies and what has been documented from other studies and research. In addition to reviewing data from past projects, peak migration timing is can also be determined by watching real time NEXRAD radar data, as well as a couple websites that indicate when migration is occurring across the country to further indicate when it may occur at the site (e.g., www.woodcreeper.com). In addition to these information's sources, weather forecasts are also reviewed to determine the right conditions we would expect to see birds migrate. Since surveys were initiated at Georgia Mountain on 9/11/2008, we feel confident that if we were to only sample ten nights (we have started surveys by Sept 11) it would be right on with the typical peak fall migration period. However, if the results of just 10 nights of survey show something very different or alarming than what we have seen at other sites in VT and the northeast over the past four years we would recommend a full 20 night study in the spring 2009.

If you have any questions on this please feel free to contact me.

Thanks,

Adam

Adam Gravel
Project Manager / Wildlife Biologist
Stantec - Formerly Woodlot Alternatives
30 Park Drive
Topsham ME 04086
Ph: (207) 729-1199
Fx: (207) 729-2715
adam.gravel@stantec.com
stantec.com

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State of Vermont

AGENCY OF NATURAL RESOURCES
103 South Main Street
Center Building
Waterbury, Vermont 05671-0301

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation

September 22, 2008

Ms. Martha Staskus
Vermont Environmental Research Associates
1209 Harvey Farm Rd.
Waterbury Center, VT 05677

Re: 10 Night Survey Request – Georgia

Dear Martha:

Thank you for forwarding the email from Adam Gravel of Stantec dated September 17, 2008. In the email, Mr. Gravel provided data in support of a request for a reduction in the minimum number of nights for the fall migration period during which radar sampling of birds must occur. The Agency can not approve your request at this time.

The Agency Guidelines released in April 2006 do anticipate 'tailoring studies to the size, complexity, and location of the project…'; however, the Agency does not believe sufficient data has been provided to warrant a reduction to an already established minimum. Specifically, the Agency has concerns over the comparison of the Sheffield location to the Georgia Mountain location. The Agency believes the proximity of Georgia Mountain to Lake Champlain warrants collection of a larger dataset at this time.

If you have additional questions, feel free to contact me at 802-241-3691.

Sincerely,

Jeannine McCrumb
Regulatory Policy Analyst

c John Austin, VTFWD *via email*
Scott Darling, VTFWD *via email*
Forrest Hammond, VTFWD *via email*
Elizabeth Lord, VTANR Act 250 & Regulatory Mgmt. *via email*
Steve Sease, VTANR Act 250 & Regulatory Mgmt. *via email*

Appendix B

Radar Survey Data Tables

Appendix B Table 1. Summary of passage rates by hour, night, and for entire season.

Night of	Passage Rate (targets/km/hr) by hour after sunset													Entire Night			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**Mean**	**Median**	**Stdev**	**SE**
9/10	169	441	339	307	257	254	86	104	79	21	59	--	--	**192**	**169**	**136**	**41**
9/12	60	86	--	--	--	56	21	59	43	57	96	21	--	**56**	**57**	**25**	**8**
9/13	266	839	844	793	638	546	437	193	--	94	--	--	--	**517**	**546**	**286**	**95**
9/14	59	90	123	--	--	86	116	146	136	143	214	96	--	**121**	**120**	**43**	**14**
9/17	364	683	510	379	443	--	600	647	718	806	707	43	--	**536**	**600**	**219**	**66**
9/18	643	1171	1187	1106	1084	788	354	354	214	221	182	43	--	**612**	**498**	**436**	**126**
9/19	214	343	343	393	370	368	250	204	250	186	214	107	--	**270**	**250**	**91**	**26**
9/21	857	1007	1063	1061	778	911	485	375	354	113	--	--	--	**700**	**817**	**341**	**108**
9/22	243	786	600	563	579	690	450	407	332	193	229	43	--	**426**	**429**	**225**	**65**
9/23	93	279	347	434	377	300	326	236	289	166	196	--	--	**277**	**289**	**99**	**30**
9/24	79	477	455	466	455	343	351	229	230	300	293	295	79	**312**	**300**	**135**	**37**
9/25	373	446	421	443	493	375	257	311	279	284	207	343	--	**353**	**358**	**88**	**25**
9/28	179	551	489	102	57	46	94	104	--	--	--	--	--	**203**	**103**	**201**	**71**
9/29	--	--	350	498	498	680	652	552	520	332	343	101	0	**411**	**498**	**214**	**64**
9/30	171	236	300	361	357	--	--	116	129	104	111	--	--	**209**	**171**	**107**	**36**
10/2	332	737	592	279	164	150	107	93	94	100	21	100	0	**213**	**107**	**222**	**62**
10/3	182	107	179	210	150	171	227	193	200	182	171	96	--	**172**	**180**	**39**	**11**
10/4	750	763	719	530	438	332	--	--	--	--	--	--	--	**589**	**625**	**182**	**74**
10/5	13	54	139	518	482	541	450	343	279	309	300	229	21	**283**	**300**	**185**	**51**
10/6	43	573	884	788	714	611	500	307	313	257	161	113	32	**407**	**313**	**290**	**80**
10/7	193	311	159	86	118	48	43	36	54	64	21	64	7	**93**	**64**	**85**	**23**
Means for Entire Season	**264**	**499**	**502**	**490**	**445**	**384**	**306**	**250**	**251**	**207**	**207**	**121**	**23**	**326**	**279**	**259**	**17**
Medians for Entire Season	**193**	**477**	**455**	**454**	**444**	**355**	**316**	**229**	**250**	**184**	**202**	**100**	**21**				

-- indicates no data for that hour

Appendix B Table 2. Mean Nightly Flight Direction		
Night of	**Mean Flight Direction**	**Circular Stdev**
9/10	213	57
9/12	33	35
9/13	263	73
9/14	44	43
9/17	231	124
9/18	229	45
9/19	16	34
9/21	235	32
9/22	232	35
9/23	43	106
9/24	20	47
9/25	352	40
9/28	201	34
9/29	227	42
9/30	337	48
10/2	132	69
10/3	145	50
10/4	216	29
10/5	217	62
10/6	197	31
10/7	183	48
Entire Season	**230**	**84**

Appendix B Table 3. Summary of mean flight heights by hour, night, and for entire season.

Night of	Mean Flight Height (m) by hour after sunset													Entire Night				% of targets below 120 meters
	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	Median	STDV	SE	
9/10	--	522	589	503	454	391	415	364	336	386	240	--	--	420	415	101	32	8%
9/12	140	418	--	--	349	282	272	329	286	264	215	--	--	284	284	79	26	17%
9/13	268	344	449	471	403	308	317	284	--	320	--	--	--	352	344	72	24	8%
9/14	266	292	314	309	268	287	271	242	238	260	248	241	--	270	269	26	8	10%
9/17	198	276	311	308	287	--	--	351	361	389	382	--	--	318	318	60	20	12%
9/18	486	481	434	465	425	409	430	428	405	421	416	--	--	436	428	28	8	2%
9/19	200	301	310	354	335	347	315	254	306	269	254	250	--	291	303	46	13	11%
9/21	460	491	510	488	417	401	--	400	374	302	--	--	--	427	417	67	22	3%
9/22	322	390	329	352	378	402	343	317	369	334	270	405	--	351	352	40	12	13%
9/23	232	355	330	360	342	--	373	335	292	351	310	393	--	334	342	44	13	7%
9/24	184	256	294	277	276	299	310	301	280	282	323	438	474	307	299	74	21	16%
9/25	243	310	283	291	273	315	300	306	305	361	295	286	--	297	299	28	8	14%
9/28	--	398	--	402	445	441	449	426	--	--	--	--	--	427	427	22	9	1%
9/29	--	--	524	510	496	558	522	503	477	451	378	398	653	497	500	75	23	1%
9/30	177	323	343	295	300	--	--	347	302	292	290	--	--	297	300	50	17	8%
10/2	230	513	438	442	427	295	249	271	197	320	214	171	--	314	304	114	33	9%
10/3	286	333	367	284	383	327	367	356	303	299	248	289	--	320	324	42	12	9%
10/4	301	381	350	345	375	394	--	--	--	--	--	--	--	358	367	34	14	6%
10/5	81	428	503	528	455	505	477	486	508	443	459	394	769	464	477	146	41	3%
10/6	331	470	554	570	552	554	527	497	462	480	399	319	438	473	480	83	23	3%
10/7	427	501	621	--	526	562	558	586	762	417	398	547	560	539	553	100	29	0%
Mean for Entire Season	**268**	**389**	**413**	**398**	**389**	**393**	**382**	**369**	**365**	**349**	**314**	**344**	**579**	**371**	**351**	**107**	**7**	**7%**
Median for Entire Season	**255**	**386**	**367**	**360**	**383**	**393**	**367**	**349**	**321**	**334**	**295**	**356**	**560**					

-- indicates no data for that hour

Appendix B Table 4. Summary of available fall avian radar survey results									
Project Site	**Number of Survey Nights**	**Number of Survey Hours**	**Landscape**	**Average Passage Rate (t/km/hr)**	**Range in Nightly Passage Rates**	**Avg. Flight Direction**	**Avg. Flight Height (m)**	**(Turbine Ht) % Targets Below Turbine Height**	**Citation**
Fall 1998									
Harrisburg, NY	35	n/a	Great Lakes plain/ADK foothills	122	n/a	181	182	45	Cooper and Mabee 2000
Wethersfield, Wyoming Cty, NY	35	n/a	Agricultural plateau	168	n/a	179	154	57	Cooper and Mabee 2000
Fall 2003									
Westfield Chautauqua Cty, NY	30	180	Great Lakes shore	238	10-905	199	532	(125 m) 4 %	Cooper *et al.* 2004c
Mt. Storm, Grant Cty, WV	45	270	Forested ridge	241	8-852	184	410	n/a	Cooper *et al.* 2004b
Fall 2004									
Franklin, Pendleton Cty, WV	34	349	Forested ridge	229	18-643	175	583	(125 m) 8%	Woodlot 2005a
Prattsburgh, Steuben Cty, NY	30	315	Agricultural plateau	193	12-474	188	516	(125 m) 3%	Woodlot 2005b
Prattsburgh, Steuben Cty, NY	45	292.5	Agricultural plateau	200	18-863	177	365	(125 m) 9.2%	Mabee *et al.* 2005a
Martindale, Lancaster, Cty, PA	n/a	n/a	Reclaimed minelands	187	n/a	188	436	(n/a) 8%	Young 2006
Casselman, Somerset Cty, PA	n/a	n/a	Reclaimed minelands	174	n/a	219	448	(n/a) 7%	Young 2006
Deerfield, Bennington Cty, VT (Existing Facility)	28	300	Forested ridge	175	7-519	194	438	(100 m) <1%	Woodlot 2005c
Deerfield, Bennington Cty, VT (Western Expansion)	14	159	Forested ridge	193	8-1121	223	624	(100 m) 5%	Woodlot 2005c
Deerfield, Bennington Cty, VT (Valley Site)	13	136	Forested ridge	150	58-404	214	503	(100 m) < 1%	Woodlot 2005c
Deerfield, Bennington Cty, VT (3 sites combined)	28	595	Forested ridge	178	7-1121	212	611	(100 m) 3%	Woodlot 2005c
Sheffield, Caledonia Cty, VT	18	176	Forested ridge	114	19-320	200	566	(125 m) 1%	Woodlot 2006a
Fall 2005									
Churubusco, Clinton Cty, NY	38	414	Great Lakes plain/ADK foothills	152	9-429	193	438	(120 m) 5%	Woodlot 2005l
Ellenberg, Clinton Cty, NY	n/a	n/a	Great Lakes plain/ADK foothills	197	n/a	162	333	(n/a) 12%	Mabee *et al.* 2006a
Dairy Hills, Clinton Cty, NY	n/a	n/a	Agricultural plateau	94	n/a	180	466	(n/a) 10%	Young et al. 2006
Flat Rock, Lewis Cty, NY	n/a	n/a	Great Lakes plain/ADK foothills	158	n/a	184	415	(n/a) 8%	ED&R 2006a
Clayton, Jefferson Cty, NY	37	385	Agricultural plateau	418	83-877	168	475	(150 m) 10%	Woodlot 2005m
Bliss, Wyoming Cty, NY	8	n/a	Agricultural plateau	440	52-1392	n/a	411	(125 m) 13%	Young 2006
Perry, Wyoming Cty, NY	n/a	n/a	Agricultural plateau	64	n/a	180	466	(125 m) 10%	Young 2006
Sheldon, Wyoming Cty, NY	36	347	Agricultural plateau	197	43-529	213	422	(120 m) 3%	Woodlot 2005n
Howard, Steuben Cty, NY	39	405	Agricultural plateau	481	18-1434	185	491	(125 m) 5%	Woodlot 2005o
Fairfield, Herkimer Cty, NY	38	423	Agricultural plateau	691	116-1351	198	516	(125 m) 4%	Woodlot 2005p
Jordanville, Herkimer Cty, NY	38	404	Agricultural plateau	380	26-1019	208	440	(125 m) 6%	Woodlot 2005q
Munnsville, Madison Cty, NY	31	292	Agricultural plateau	732	15-1671	223	644	(118 m) 2%	Woodlot 2005r
Deerfield, Bennington Cty, VT	32	324	Forested ridge	559	3-1736	221	395	(100 m) 13%	Woodlot 2005s
Kibby, Franklin Cty, ME (Mountain)	12	115	Forested ridge	565	109-1107	167	370	(125 m) 16%	Woodlot 2006d
Kibby, Franklin Cty, ME (Range 1)	12	101	Forested ridge	201	12-783	196	352	(125 m) 12%	Woodlot 2006d
Kibby, Franklin Cty, ME (Valley Site)	5	13	Forested valley	452	52-995	193	391	(125 m) 16%	Woodlot 2006d
Mars Hill, Aroostook Cty, ME	18	117	Forested ridge	512	60-1092	228	424	(120 m) 8%	Woodlot 2005t
Fall 2006									
Chateaugay, Franklin Cty, NY	35	327	Agricultural plateau	643	38-1373	212	431	(120 m) 8%	Woodlot 2006j
Wethersfield, Wyoming Cty, NY	56	n/a	Agricultural plateau	256	31-701	208	344	(125 m) 11%	Mabee et al. 2006c
Centerville, Allegany Cty, NY	57	n/a	Agricultural plateau	259	12-877	208	350	(125 m) 12%	Mabee et al. 2006c
Lempster, Sullivan Cty, NH	32	290	Forested ridge	620	133-1609	206	387	(125 m) 8%	Woodlot 2007a
Stetson, Penobscot Cty, ME	12	77	Forested ridge	476	131-1192	227	378	(125 m) 13%	Woodlot 2007b
Cape Vincent, Jefferson Cty, NY	63	508	Great Lakes plain	346	n/a	209	490	(125 m) 8%	WEST 2007
Fall 2007									
Coos County, NH	29	232	Forested ridge	366	54 to 1234	223	343	(125 m) 15%	Stantec 2007b
Wolfe Island, Ontario, Canada*	n/a	n/a	Interior Lake Island	n/a	n/a	95	233	(125m) 23%	EchoTrack 2008
Laurel Mountain, VA	20	212	Forested ridge	321	76-513	209	533	(130 m) 6%	Woodlot 2007f

*Certain pieces of information are not available for comparison due to differences in survey methodology and design.