Based on the breeding bird survey data collected in 2006, the St. Lawrence Windpower project area does not appear to have any large or unusual populations of breeding resident birds. Mortality results from two other eastern wind plants studied indicate that turbines on eastern mountain ridgelines result in between 4 and 8 bird fatalities per turbine per year (see Kerns and Kerlinger 2004 and Nicholson 2002, 2003). In both of these studies it was estimated that approximately two-thirds of the avian fatalities were migrants. Provided impacts at the St. Lawrence Windpower project area are similar, it is not expected that breeding resident birds are at significant risk from the wind project. Due to the diversity of birds recorded in the mixed farmland habitat, impacts are expected to be spread over several commonly observed species.

4.4 Nocturnal AnaBat Surveys

Passage Rates

To date monitoring studies of wind projects have shown a few common trends in bat mortality. Risk to bats from turbines appears to be unequal across species and seasons where increased mortality occurs during the post breeding or fall migration season (roughly mid-July through September) among migrant bats species (see Johnson 2005). Some studies have shown apparent low risk from turbines to resident bat populations (Johnson et al. 2003) while others have shown that mortality is not correlated with AnaBat call rates (Nicholson 2002, 2003). The post-construction mortality data collected at existing regional projects appears to be the best available predictor of mortality levels and species composition for proposed wind projects.

The number of bats detected per night at the project met tower was highest in the spring (19.7 calls/night) and summer (22.0 calls/night). These results contrast with results of mortality studies of bats at wind projects in the U.S., which have shown a peak in mortality in August and September (see Johnson 2005). While the survey efforts varied among the different studies, the studies that included AnaBat surveys and fatality surveys showed a general association between the timing of bat calls and timing of mortality, with both peak call rates and peak mortality occurring during the fall. Lower bat activity was recorded at the project met tower during fall migration (9.26 calls/night) than other times during the year. Bat activity collected at the project met tower suggests that bat activity declined in the fall and thus fewer bats would be exposed to risk of collision at the St. Lawrence Windpower project.

Bat activity captured at non-met locations during migration seasons and summer was higher than that recorded at the met tower. Activity at the non-met sampling locations range from 29–33 calls/night during migration seasons to 56 calls/night during summer breeding season. Consistent differences in bat activity between met and non-met locations is likely due largely to habitat at the sampling locations. Acoustic sampling at the met tower, located in an open pasture and a location recommended by agency personnel, should be more reflective of bat activity in areas where turbines will be constructed. The differences between the met tower station and non-met stations are likely due to the relative abundance of bats occurring in pastures versus more diverse habitat such as edge or woodlots. Ultimately, however, predicted risk to migratory and breeding bats using acoustic monitoring appears to be limited based on previous studies at other wind sites where there have been conflicting results.

Species Identification

While interspecific variation in echolocation call structure exists among the *Myotis* species, significant variation can exist intraspecifically among individuals and populations (Broders et al. 2004). Plasticity among calls of an individual based on a number of factors (e.g., habitat, presence of conspecifics, etc.) can further confound species identification (Barclay and Brigham 2004). Given the similarity of *Myotis* species, both morphologically and acoustically, these species are generally acknowledged as being among the more difficult to identify. To determine presence of a federally endangered *Myotis* species, Indiana bat, within the St. Lawrence Windpower project area, all call files with signatures resembling *Myotis* species were submitted for quantitative analysis to NYSDEC-recommended bat biologist, Eric Britzke. A total of 208 call files were analyzed using a classification model based on discriminate function analysis (DFA) that utilizes 10 quantitative measures of individual call sequences (Britzke 2003, Britzke and Murray 2001). As is typical of AnaBat call analysis, the majority of the calls (n=76) were still unable to be categorized to species using the procedure. Of those calls with adequate signatures, 22 had call parameters similar to eastern red bat, 50 to little brown bat, 44 to northern myotis, and 16 to Indiana bat. Calls with characteristics of Indiana bat were recorded at several locations within the project area from May 9 – September 21, with about half of the calls occurring at one sampling location between May 23 – 29, 2006. No sampled nights at any site had >2 call files with characteristics of Indiana bat. Due to the probabilistic nature and opportunity for misidentification and inaccuracy in species identification, multiple calls of a species must be detected in a single night to definitively determine species presence (Britzke et al. 2002). This is a conservative approach, but serves to ensure that variation caused by inaccurate identification is not included in the species identification results. Based on this approach, there are insufficient files to statistically support the presence of Indiana bats at any of the sites or nights examined (E. Britzke, pers. communication), however, there is some possibility that Indiana bat occurs on the site.

Though statistical analysis of *Myotis* species calls recorded by the AnaBats failed to conclusively document Indiana bat, the St. Lawrence Windpower project area is within the recognized range of the species. Indiana bats are known to winter in a hibernaculum near Watertown. Movement of females dispersing from hibernacula to breeding areas has been tracked by NYSDEC from 2002 – 2006 (NYSDEC 2006). Individuals have been recorded traveling up to 40 miles from wintering caves and several dispersing females were reported in Clayton, New York, located within approximately 6 miles northeast of the proposed St. Lawrence Windpower project area. Suitable roosting habitat, characterized by trees or snags >5 inches in diameter with exfoliating bark and cracks/crevices (USFWS 1999), is present within the project area. Additionally, several riparian areas and wetlands, such as forested wetland and floodplain forests, occur within the project area and provide foraging and roosting habitat for Indiana bat and other bat species.

The results of the AnaBat surveys along with available information suggest that Indiana bats may occupy the site in low density. Because of the status of this species, further investigations including habitat mapping and potentially mist-netting surveys are warranted. Additional study scope, methods, and objectives will be discussed with the NYSDEC and USFWS and implemented in 2007. Detailed habitat mapping for the species, with a focus on suitable trees/woodlots for maternal colonies, is recommended. The utility of mist-netting to confirm

presence/absence of the species and likelihood of impacts based on relative density within the project area will be further evaluated in consultation with the agencies.

4.5 Waterfowl and Winter Raptor Surveys

Due to the coastal nature of the project area, potential impacts to waterfowl and raptors that frequent the area during migration and winter season was raised as a concern. Four species of waterfowl, three species of waterbirds and eight species of raptors were recorded on the St. Lawrence Windpower project area during the waterfowl and winter raptor surveys. The vast majority of the waterfowl use of the site was of Canada goose. Generally, geese were observed in large flocks foraging in agricultural fields and flying over the St. Lawrence Windpower project area. Canada goose has had recorded fatalities at other monitored wind projects primarily in the western U.S.; however, they are not a common fatality. In general, waterfowl fatalities at wind projects are rare (see Erickson et al 2001, 2002, Koford et al. 2005). While the proposed St. Lawrence Windpower project would increase risk of collision-related mortality to Canada goose, impacts are not expected to be significant due to the large numbers of this species in the region and the low occurrence of collision fatalities at wind projects.

The most common raptor species recorded during the winter driving and fixed point surveys were red-tailed and rough-legged hawk. Although the proposed St. Lawrence Windpower project would increase collision risk for wintering red-tailed and rough-legged hawks over existing condition, impacts are not expected to be significant. These raptor species have a relatively low exposure index based on the survey results (Table 2), and raptor mortality has been relatively low at other eastern wind projects that have been monitored (see Kerns and Kerlinger 2004, Nicholson 2002, 2003, Koford et al. 2005, Arnett et al. 2005). There is no information to suggest that winter raptor mortality would be greater at the St. Lawrence Windpower project that other wind projects studied.

5.0 References

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