

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 than other wind projects studied.

5.0 References

- Andrle, R.F. and J.R. Carroll. 1988. *The Atlas of Breeding Birds in New York State*. Cornell University Press, Ithaca, New York.
- Barclay, R.M. and R.M. Brigham. 2004. Geographic variation in the echolocation calls of bats: a complication for identifying species by their calls *in* *Bat Echolocation Research: Tools, techniques, and analysis*. Bat Conservation International. Austin, Texas.
- Batschelet, E. 1981. *Circular Statistics in Biology*. Academic Press, London.
- Bibby, C.J., N.D. Burgess, and D.A. Hill. 1992. *Bird Census Techniques*. Academic Press, New York. 257 pp.
- Britzke, E.R. 2003. Use of ultrasonic detectors for acoustic identification and study of bat ecology in the eastern United States. Ph.D. dissertation, unpublished.

- Britzke, E.R. and K.L. Murray. 2001. A quantitative method for the selection of identifiable search-phase calls using the AnaBat system. *Bat Research News* 41:33-36.
- Britzke, E.R., K.L. Murray, J.S. Heywood, and L.W. Robbins. 2002. Acoustic identification. Pp. 220-224 in *The Indiana bat: biology and management of an endangered species* (A. Kurta and J. Kennedy, eds.). Bat Conservation International, Austin, TX.
- Broders, H.G., C.S. Findlay, and L. Zheng. 2004. Effects of clutter on echolocation call structure of *Myotis septentrionalis* and *Myotis lucifugus*. *Journal of Mammology* 85:273-281.
- Cooper, B.A., A.A. Stickney and T.J. Mabee. 2004a. A radar study of nocturnal bird migration at the proposed Chautauqua Wind Energy Facility, New York, Fall 2003. Technical report prepared for Chautauqua Windpower LLC.
- Cooper, B.A., T.J. Mabee, A.A. Stickney and J.E. Shook. 2004b. A visual and radar study of 2003 spring bird migration at the proposed Chautauqua Wind Energy Facility, New York. Technical report prepared for Chautauqua Windpower LLC.
- Cooper, B. A. and T. J. Mabee. 2000. Bird Migration Near Proposed Wind Turbine Sites at Wethersfield and Harrisburg, New York. Final Report. Prepared for Niagara Mohawk Power Corporation.
- Cooper, B. A., C. B. Johnson, and R. J. Ritchie. 1995. Bird Migration Near Existing and Proposed Wind Turbine Sites in the Eastern Lake Ontario Region. Final Report. Prepared for Niagara Mohawk Power Corporation.
- Cooper, B.A., R.H. Day, R.J. Ritchie, and C.L. Cranor. 1991. An improved marine radar system for studies of bird migration. *J. Field Ornithol.* 62:367-377.
- Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2002. *Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. (Draft for review).* New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.
- Erickson, W.P., G.D. Johnson, M.D. Strickland, D.P. Young, Jr., K.J. Sernka, R.E. Good. 2001. Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons to Other Sources of Avian Collision Mortality in the United States. National Wind Coordinating Committee (NWCC) Resource Document. August 2001.
- Erickson, W., G. Johnson, D. Young, D. Strickland, R. Good, M. Bourassa, K. Bay, K. Sernka. 2002. Synthesis and Comparison of Baseline Avian and Bat Use, Raptor Nesting and Mortality Information from Proposed and Existing Wind Developments. Technical Report prepared for: Bonneville Power Administration, Portland, Oregon. Prepared by Western EcoSystems Technology, Inc., Cheyenne, Wyoming, December 2002.
- Harmata, A.R., K.M. Podruzny, J.R. Zelenak and M.L. Morrison. 1999. Using marine surveillance radar to study bird movements and impact assessment. *Wildlife Society Bulletin*, 27(1):44-52.
- Hawk Migration Association of North America. 2006. HawkCount Monthly Summaries. Hawk Migration Association of North America, Raptors Online. <http://www.hawkcount.org/>
- Hawrot, R.Y. and J. M. Hanowski. 1997. Avian assessment document: avian population analysis for wind power generation regions-012. NRRI/TR-97-23.
- Kerns, J. and P. Kerlinger. 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 Mountaineer Wind Energy Center Technical Review Committee. Curry and Kerlinger, LLC. 39 pp.
- Koford, R., A. Jain, G. Zenner. 2005. Avian Mortality Associated with the Top of Iowa Wind Farm, Calendar Year 2004. Iowa State University and Iowa Department of Natural Resources. February 2005.
- Mabee, T. J., and B. A. Cooper. 2000. Nocturnal Bird Migration at the Nine Canyon Wind Energy Project, Fall 2000. Final Report. Prepared for Western EcoSystems Technology, Inc. and Energy Northwest.
- Mabee, T. J. and B. A. Cooper. 2001. Nocturnal Bird Migration at the Nine Canyon Wind Energy Project, Spring 2001. Final Report. Prepared for Western EcoSystems Technology, Inc. and Energy Northwest.
- Mabee, T. J. and B. A. Cooper. 2002. Nocturnal Bird Migration at the Stateline and Vansycle Wind Energy Projects, 2000-2001. Final Report. Prepared for CH2M Hill and FPL Energy Vansycle, LLC.
- Mabee, T.J., J.H. Plissner, and B.A. Cooper. 2005. A Radar and Visual Study of Nocturnal Bird and Bat Migration at the Proposed Flat Rock Wind Power Project, New York, Fall 2004. Final Report. Prepared for Atlantic Renewable Energy Corporation.
- NYSDEC. 2003. Endangered Species Program, Species Fact Sheets. New York State Department of Environmental Conservation, Endangered Species Unit, Albany, New York. <http://www.dec.state.ny.us/website/dfwmr/wildlife/endspec/>
- NYSDEC. 2006. Indiana Bat Fact Sheet. New York State Department of Environmental Conservation, Endangered Species Unit, Albany, New York. 3pp.
- Reynolds, R.T., J. M. Scott, and R. A. Nussbaum. 1980. A Variable Circular-Plot Method for estimating bird numbers. *Condor* 82(3): 309-313.
- Roy, R. D. and S. K. Pelletier. 2005. Fall 2004 Migration Surveys at the Proposed Searsburg and Readsboro, Vermont. Prepared for Vermont Environmental Research Associates and enXco, Inc.
- Sauer, J. R., J. E. Hines, and J. Fallon. 2005. The North American Breeding Bird Survey, Results and Analysis 1966 - 2004. Version 2005.2. [USGS Patuxent Wildlife Research Center](http://www.fws.gov/patuxent/), Laurel, MD
- U.S. Fish and Wildlife Service. 1999. Agency Draft Indiana Bat (*Myotis sodalis*) Revised Recovery Plan. Fort Snelling, MN: U.S. Department of the Interior, Fish and Wildlife Service, Region 3.
- Young, Jr., D. P., D. Strickland, W. P. Erickson, K. J. Bay, R. Canterbury and R. Mabee, B. Cooper and J. Plissner. 2003. Baseline Avian Studies Mount Storm Wind Power Project, Grant County, West Virginia, May 2003-March 2004. Prepared for NedPower Mount Storm, LLC.