NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Conestogo Wind Energy Centre

2014 Bird & Bat Mortality Monitoring

Natural Resource Solutions Inc. conducted post-construction monitoring at the operational Conestogo Wind Energy Centre near the Town of Arthur, in Wellington County, Ontario. This wind energy project is 22.921MW in size and consists of 10 operational turbines. The purpose of this fact sheet is to provide an executive summary of the methods, analysis, and results of the second year of post-construction mortality monitoring that was conducted at the Conestogo Wind Energy Centre in 2014.

Methods

NRSI biologists conducted bird and bat mortality monitoring following MNRF guidelines *(Bats and Bat Habitats: Guidelines for Wind Power Projects*; and *Birds and Bird Habitats: Guidelines for Wind Power Projects*, July 2011). The implemented monitoring program was approved by the MNRF. Per the MNRF guidelines, the following methods were implemented for the monitoring study:

- All 10 turbines were searched twice weekly from May through October, and once weekly in November;
- Searches were conducted in circular areas with a 50m radius, centered at each turbine tower;
- Search plots were maintained to be free of crops, weeds, and debris for high visibility of potential mortalities;
- Searcher efficiency trials were conducted in each study season to assess the effectiveness of each searcher;
- Scavenger removal trials were conducted in each study season to assess the level of scavenging activity at the turbines.

Results

Birds

During the 2014 post-construction mortality monitoring at the Conestogo Wind Energy Centre, a total of 19 bird mortalities were found within the search radius of operational turbines. Observed bird mortalities consisted primarily of small landbird species, as well as one shorebird and one waterbird, all of which are considered common in the province. No more than 2 mortalities were observed of any one species.

Following the MNRF Guidelines, NRSI biologists inputted the searcher efficiency, scavenger removal, and percent area searched variables into the MNRF's estimated mortality equation to determine an estimated rate of bird mortality at the Conestogo Wind Energy Centre of 2.83 birds/turbine/year. This is below the MNRF threshold of 14 birds/turbine/year. By comparison, the average bird mortality rate in Ontario is estimated at 5.45 ± 0.76 birds/turbine/year (Bird Studies Canada Wind Energy Bird and Bat Monitoring Database, Summary Findings, July 2014).

Bats

During the post-construction mortality monitoring at the Conestogo Wind Energy Centre, a total of 50 bat mortalities were found within the search radius of the turbines. Bat mortalities consisted of both resident and migratory species. Bat mortalities consisted of both resident and migratory species. The most abundantly observed species was the silver-haired bat (*Lasionycteris noctivagans*), which accounted for approximately 40% of the total bat mortalities observed during the 2014 monitoring period.

Following the MNRF Guidelines, NRSI biologists inputted the searcher efficiency, scavenger removal, and percent area searched variables into the MNRF's estimated mortality equation to determine an estimated rate of bat mortality at the Conestogo Wind Energy Centre of 7.02 bats/turbine/year. This is below the MNRF threshold of 10 bats/turbine/year. By comparison, the average bat mortality rate in Ontario is estimated at 19.08 ± 2.38 bats/turbine/year (Bird Studies Canada Wind Energy Bird and Bat Monitoring Database, Summary Findings, July 2014).

Raptors

A single raptor mortality, a red-tailed hawk (*Buteo jamaicensis*), was observed at the Conestogo Wind Energy Centre in 2014. Based on the information collected by NRSI during the 2014 post-construction mortality monitoring period, the mortality rate was 0.1 raptors/turbine/year. In addition, a single incidental raptor mortality was brought to the attention of NRSI biologists during the 2014 monitoring period. At this time, the Bird Studies Canada Wind Energy Bird and Bat Monitoring Database Summary Findings do not calculate average raptor mortality, so there is no Ontario average raptor mortality rate available for comparison.

Summary

Based on the results of the 2014 post-construction monitoring at the Conestogo Wind Energy Centre, none of the annual or single day mortality thresholds were met or exceeded. These thresholds, as defined by the MNRF guidelines, and the associated results of the 2014 monitoring at the Conestogo Wind Energy Centre are briefly outlined below:

MNRF Mortality Threshold	Type of Threshold	2014 Summary Conestogo
14 birds/turbine/year	Annual Corrected Rate	2.83 birds/turbine/year
10 bats/turbine/year	Annual Corrected Rate	7.02 bats/turbine/year
0.2 raptors/turbine/year	Annual Corrected Rate	0.1 raptors/turbine/year
10 or more birds at one turbine	Single Day Event	1 bird at one turbine (maximum single day)
33 or more birds at multiple turbines	Single Day Event	2 birds at multiple turbines (maximum single day)