



## Niagara Region Wind Farm 2017 Bird & Bat Mortality Monitoring

Natural Resource Solutions Inc. conducted post-construction monitoring at the operational Niagara Region Wind Farm located within the Townships of West Lincoln and Wainfleet, and the Town of Lincoln, within Niagara Region and Haldimand County, Ontario. This wind energy project is 230MW in size and consists of 77 operational turbines. The purpose of this fact sheet is to provide an executive summary of the methods, analysis, and results of the first year of post-construction mortality monitoring that was conducted at the Niagara Region Wind Farm in 2017.

### Methods

NRSI biologists conducted bird and bat mortality monitoring following MNRF guidelines (*Bats and Bat Habitats: Guidelines for Wind Power Projects*, July 2011; and *Birds and Bird Habitats: Guidelines for Wind Power Projects*, December 2011) and the Project's Environmental Effects Monitoring Plan (EEMP) (Stantec 2013). The implemented monitoring program was approved by the MNRF. Per the MNRF guidelines, the following methods were implemented for the monitoring study:

- A subset of 23 turbines were searched twice weekly from May through October, and once weekly in November;
- The remaining 54 turbines were searched monthly from May to November;
- A subset of 2 turbines were also searched weekly from January through March, and again in December, based on the proximity of the turbines to significant raptor habitats;
- 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 2017 post-construction mortality monitoring at the Niagara Region Wind Farm, 111 bird mortalities were found within the search radius of operational turbines.

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 Niagara Region Wind Farm of 7.39 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  $5.70 \pm 0.01$  birds/turbine/year (*Bird Studies Canada Wind Energy Bird and Bat Monitoring Database, Summary Findings, July 2017*).

### Raptors

A total of 8 raptor mortalities were observed during twice-weekly monitoring at the Niagara Region Wind Farm during 2017 post-construction mortality monitoring, all of which represent common species with secure populations in the province. Based on the information collected by NRSI during the monitoring period, the mortality rate was determined to be 0.37 raptors/turbine/year (0.00 provincially tracked raptors/turbine/year). This is above the MNRF threshold of 0.2 raptors/turbine/year (0.1 provincially tracked raptors/turbine/year). By comparison, the average raptor mortality rate in Ontario is estimated at  $0.24 \pm 0.004$  raptors/turbine/year (*Bird Studies Canada Wind Energy Bird and Bat Monitoring Database, Summary Findings, July 2017*).

### Bats

During 2017 post-construction mortality monitoring at the Niagara Region Wind Farm, 126 bat mortalities were found within the search radius of the turbines. Bat mortalities consisted of both resident and long-distant migratory 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 bat mortality at the Niagara Region Wind Farm of 8.67 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  $17.15 \pm 0.16$  bats/turbine/year (*Bird Studies Canada Wind Energy Bird and Bat Monitoring Database, Summary Findings, July 2017*).

### **Summary**

Based on the results of the 2017 post-construction monitoring at the Niagara Region Wind Farm, the annual raptor mortality threshold, and a single day bird threshold (10 or more birds at one turbine) were exceeded. Through a detailed ecological consideration of this single day event, it was determined to be a rare, and isolated, event that remains unlikely to happen again at this turbine at any point in the future.

No other annual or single day mortality thresholds were met or exceeded. These thresholds, as defined by the MNRF guidelines, and the associated results of the 2017 monitoring at the Niagara Region Wind Farm are briefly outlined below:

MNRF Mortality Threshold	Type of Threshold	2017 Summary Niagara Region Wind Farm
14 birds/turbine/year	Annual Corrected Rate	7.39 birds/turbine/year
10 bats/turbine/year	Annual Corrected Rate	8.67 bats/turbine/year
0.2 raptors/turbine/year	Annual Corrected Rate	0.37 raptors/turbine/year
10 or more birds at one turbine	Single Day Event	12 birds at one turbine (maximum single day)
33 or more birds at multiple turbines	Single Day Event	16 birds at multiple turbines (maximum single day)