NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Niagara Region Wind Farm

2018 Bird & Bat Mortality Monitoring

Natural Resource Solutions Inc. (NRSI) 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 has a generating capacity of 230MW and consists of 77 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 Niagara Region Wind Farm in 2018.

Methods

NRSI biologists conducted bird and bat mortality monitoring at the Niagara Region Wind Farm following Ministry of Natural Resources and Forestry (MNRF) guidelines (*Bats and Bat Habitats: Guidelines for Wind Power Projects*, July 2011; *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. As per the MNRF guidelines and EEMP, 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;
- Searches were conducted in circular plots with a 50m radius, centered at each turbine tower;
- Search plots were maintained to minimize 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; and
- Scavenger removal trials were conducted in each study season to assess the level of scavenging activity at the turbines.

A subset of two turbines were also searched weekly from January through March, and again in December, based on the proximity of the turbines to previously significant raptor habitats. However, due to changes in land use associated with agricultural practices, the habitats no longer meet provincial criteria for Significant Wildlife Habitat. As a result, weekly monitoring of these two turbines was discontinued in mid-December 2018. This modification to the monitoring requirements was made in consultation with the MNRF.

Results

Birds

During the 2018 post-construction mortality monitoring at the Niagara Region Wind Farm, 66 bird mortalities were documented within the search radii of the subset of 23

turbines. Observed bird mortalities consisted primarily of landbird species, the majority of which are considered common in the province.

Following the MNRF guidelines, NRSI biologists inputted the searcher efficiency, scavenger removal, and proportion of 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 4.97 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 4.9 ± 0.06 birds/turbine/year (Bird Studies Canada Wind Energy Bird and Bat Monitoring Database, Summary Findings, November 2018).

Raptors

During 2018 post-construction mortality monitoring at the Niagara Region Wind Farm, 11 raptor mortalities were documented within the search radii of the subset of 23 turbines. Based on the information collected by NRSI biologists during the monitoring period, the mortality rate was estimated to be 0.50 raptors/turbine/year. This is above the MNRF threshold of 0.2 raptors/turbine/year. By comparison, the average raptor mortality rate in Ontario is estimated at 0.3 ± 0.004 raptors/turbine/year (Bird Studies Canada Wind Energy Bird and Bat Monitoring Database, Summary Findings, November 2018). No mortalities of provincially tracked raptors were documented at any turbine.

Bats

During 2018 post-construction mortality monitoring at the Niagara Region Wind Farm, 103 bat mortalities were documented within the search radii of the subset of 23 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 proportion of 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 7.41 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 11.7 ± 0.1 bats/turbine/year (Bird Studies Canada Wind Energy Bird and Bat Monitoring Database, Summary Findings, November 2018).

Summary

Based on the results of the 2018 post-construction monitoring at the Niagara Region Wind Farm, the annual raptor mortality threshold was exceeded. 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 2018 monitoring at the Niagara Region Wind Farm are briefly outlined below.

MNRF Mortality Threshold	Type of Threshold	2018 Summary Niagara Region Wind Farm
14 birds/turbine/year	Annual Corrected Rate	4.97 birds/turbine/year
0.2 raptors/turbine/year	Annual Corrected Rate	0.50 raptors/turbine/year
0.1 provincially tracked raptors/turbine/year	Annual Corrected Rate	0.00 provincially tracked raptors/turbine/year
10 bats/turbine/year	Annual Corrected Rate	7.41 bats/turbine/year
10 or more birds at one turbine	Single Day Event	No occurrence
33 or more birds at multiple turbines	Single Day Event	No occurrence