NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Quixote One Wind Farm

2018 Bird & Bat Mortality Monitoring

Natural Resource Solutions Inc. (NRSI) conducted post-construction monitoring at the operational Quixote One Wind Farm, located in Bruce County within the municipality of Kincardine, Ontario. This wind energy project has a generating capacity of 2.35MW and consists of one (1) turbine. The purpose of this fact sheet is to provide an executive summary of the methods, analysis, and results of the third year of post-construction mortality monitoring that was conducted at the Quixote One Wind Farm in 2018.

Methods

NRSI biologists conducted bird and bat mortality monitoring at the Quixote One Wind Farm following Ministry of Natural Resources and Forestry (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) (Golder Associates Ltd. 2013). In accordance with the MNRF guidelines and the approved EEMP, the following methods were implemented for the monitoring study:

- The turbine was searched twice weekly from May through October, and once weekly in November;
- Searches were conducted in circular plots with a 50m radius, centered at the turbine tower;
- 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.
- Although not required by the guidelines or EEMP, search plots were maintained to be free of crops, weeds, and debris for high visibility of potential mortalities, to the extent possible.

Results

Birds

During 2018 post-construction mortality monitoring at the Quixote One Wind Farm, one (1) bird mortality was documented within the search radius. The documented bird mortality was of a landbird species that is considered common in the province.

Following the MNRF Guidelines, NRSI biologists incorporated 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 Quixote One Wind Farm of 3.25 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 Quixote One Wind Farm, no raptor mortalities were documented within the search radius. Based on the information collected by NRSI during the monitoring period, the mortality rate was 0 raptors/wind power project/year. This is below the MNRF threshold of two (2) raptors/wind power project/year (or 0.1 raptors/turbine/year for provincially tracked raptors). 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).

Bats

During 2018 post-construction mortality monitoring at the Quixote One Wind Farm, four (4) bat mortalities were documented within the search radius. All mortalities were of long-distance migratory species.

Following the MNRF Guidelines, NRSI biologists incorporated 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 Quixote One Wind Farm of 20.51 bats/turbine/year. This is above 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 2018 post-construction monitoring at the Quixote One Wind Farm, none of the single day mortality thresholds were met or exceeded. The annual mortality thresholds for birds and raptors were not exceeded but the annual mortality threshold for bats was exceeded. These thresholds, as defined by MNRF guidelines, and the associated results of 2018 monitoring at the Quixote One Wind Farm are briefly outlined below:

MNRF Mortality Threshold	Type of Threshold	2018 Summary Quixote One Wind Farm
14 birds/turbine/year	Annual Corrected Rate	3.25 birds/turbine/year
2 raptors/wind power project	Annual Rate	0 raptors/wind power project
0.1 provincially tracked raptors/turbine/year	Annual Rate	0.00 provincially tracked raptors/turbine/year
10 bats/turbine/year	Annual Corrected Rate	20.51 bats/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	Not Applicable (The project only consists of one turbine)