



Goshen Wind Energy Centre 2016 Bird & Bat Mortality Monitoring

Natural Resource Solutions Inc. (NRSI) conducted post-construction monitoring at the operational Goshen Wind Energy Centre (Goshen WEC or the Project) located in southern Huron County within the Municipalities of Bluewater and South Huron, Ontario. The Project has a generating capacity of 102MW and consists of 63 turbines. The purpose of this fact sheet is to provide a summary of the methods, analysis, and results of the second year of post-construction mortality monitoring that was conducted at the Goshen WEC in 2016.

Methods

NRSI biologists conducted bird and bat mortality monitoring at the Goshen WEC 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) (AECOM 2014). The implemented monitoring program was approved by the MNRF. Per the MNRF guidelines and the EEMP, the following methods were implemented for the monitoring study:

- A subset of 19 turbines were searched twice weekly from May through October, and once weekly in November;
- The remaining 44 turbines were searched monthly from May to November;
- Two turbines adjacent to a significant great blue heron (*Ardea herodias*) breeding colony were included in the subset of 19 turbines described above, and were also searched twice weekly in April;
- Searches were conducted in circular plots 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 2016 post-construction mortality monitoring at the Goshen WEC, a total of 55 bird mortalities were found within the search radius of the subset of 19 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 Goshen WEC

of 4.63 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 6.14 ± 0.31 birds/turbine/year (*Bird Studies Canada Wind Energy Bird and Bat Monitoring Database, Summary Findings, July 2016*). No waterfowl, including tundra swan (*Cygnus columbianus*), or great blue heron mortalities were documented at any turbine in 2016.

Bats

During the 2016 post-construction mortality monitoring at the Goshen WEC, a total of 95 bat mortalities were found within the search radius of the subset of 19 turbines. Bat mortalities consisted of both resident and 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 Goshen WEC of 7.42 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 18.52 ± 0.79 bats/turbine/year (*Bird Studies Canada Wind Energy Bird and Bat Monitoring Database, Summary Findings, July 2016*).

Raptors

A single (1) raptor mortality was observed at the Goshen WEC during 2016 post-construction mortality monitoring. Based on the information collected by NRSI during the monitoring period, the mortality rate was determined to be 0.05 raptors/turbine/year. This is below the MNRF threshold of 0.2 raptors/turbine/year. By comparison, the average raptor mortality rate in Ontario is estimated at 0.20 ± 0.01 raptors/turbine/year (*Bird Studies Canada Wind Energy Bird and Bat Monitoring Database, Summary Findings, July 2016*). No provincially tracked raptors were documented at any turbine in 2016.

Summary

Based on the results of the 2016 post-construction monitoring at the Goshen WEC, none of the annual or single day mortality thresholds for birds, bats, or raptors were exceeded. These thresholds, as defined by MNRF guidelines, and the associated results of the 2016 monitoring at the Goshen WEC are briefly outlined below:

MNRF Mortality Threshold	Type of Threshold	2016 Summary Goshen
14 birds/turbine/year	Annual Corrected Rate	4.63 birds/turbine/year
10 bats/turbine/year	Annual Corrected Rate	7.42 bats/turbine/year
0.2 raptors/turbine/year	Annual Rate	0.05 raptors/turbine/year
0.1 provincially tracked raptors/turbine/year	Annual Rate	0.00 provincially tracked raptors/turbine/year
10 or more birds at one turbine	Single Day Event	2 birds at one turbine (maximum single day)
33 or more birds at multiple turbines	Single Day Event	4 birds at multiple turbines (maximum single day)