



Goshen Wind Energy Centre 2015 Bird & Bat Mortality Monitoring

Natural Resource Solutions Inc. (NRSI) conducted post-construction monitoring at the operational Goshen Wind Energy Centre located in southern Huron County within the Municipalities of Bluewater and South Huron, Ontario. This wind energy project has a generating capacity of 102MW and consists of 63 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 Goshen Wind Energy Centre in 2015.

Methods

NRSI biologists conducted bird and bat mortality monitoring at the Goshen Wind Energy Centre 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 2015 post-construction mortality monitoring at the Goshen Wind Energy Centre, a total of 49 bird mortalities were found within the search radius of the subset of 19 operational turbines. Observed bird mortalities consisted mostly of landbird species that are considered common in the province. The most abundantly observed bird mortality was of the golden-crowned kinglet (*Regulus satrapa*).

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 Wind

Energy Centre of 4.04 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). No waterfowl, including tundra swan (*Cygnus columbianus*), or great blue heron mortalities were documented at any turbine in 2015.

Bats

During the 2015 post-construction mortality monitoring at the Goshen Wind Energy Centre, a total of 104 bat mortalities were found within the search radius of the subset of 19 turbines. Bat mortalities consisted of both resident and migratory species. The most abundantly observed species was hoary bat (*Lasiurus cinereus*), which accounted for 39% of the total bat mortalities observed during the 2015 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 Goshen Wind Energy Centre of 9.61 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 was observed at the Goshen Wind Energy Centre during 2015 post-construction mortality monitoring. Based on the information collected by NRSI during the monitoring period, the mortality rate was determined to be 0.03 raptors/turbine/year. This is below the MNRF threshold of 0.2 raptors/turbine/year. 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. No provincially tracked raptors were documented at any turbine in 2015.

Summary

Based on the results of the 2015 post-construction monitoring at the Goshen Wind Energy Centre, 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 2015 monitoring at the Goshen Wind Energy Centre are briefly outlined below:

MNRF Mortality Threshold	Type of Threshold	2015 Summary Goshen
14 birds/turbine/year	Annual Corrected Rate	4.04 birds/turbine/year
10 bats/turbine/year	Annual Corrected Rate	9.61 bats/turbine/year
0.2 raptors/turbine/year	Annual Rate	0.03 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	3 birds at multiple turbines (maximum single day)