



Goshen Wind Energy Centre 2017 Wildlife Behaviour Monitoring

Natural Resource Solutions Inc. (NRSI) conducted post-construction monitoring at the operational Goshen Wind Energy Centre (Goshen WEC) located in the Municipalities of Bluewater and South Huron in Huron County, Ontario. This wind energy project has a generating capacity of 102MW and consists of 63 turbines. This document provides an executive summary of the methods and results of the third year of post-construction wildlife monitoring conducted at the Goshen WEC in 2017.

Methods

NRSI biologists conducted post-construction wildlife behaviour monitoring at the Goshen WEC, following methods approved by the Ontario Ministry of Natural Resources and Forestry (MNRF) as part of the project's Natural Heritage Assessment (NHA) and Environmental Effects Monitoring Plan (EEMP) (AECOM 2013, 2014). As outlined in these documents, a total of 11 provincially significant wildlife habitats required post-construction surveys, including:

- Four (4) Bat Maternity Colony Habitats (BMC-189, BMC-229, BMC-326, BMC-342);
- Five (5) Amphibian Woodland Breeding Habitats (AWO-14, AWO-25, AWO-27, AWO-30, AWO-33);
- One (1) Colonially-Nesting Bird Breeding Habitat (Tree/Shrub) for nesting great blue herons (*Ardea herodias*) (CNB-01); and
- One (1) Habitat for Bird Species of Conservation Concern for red-headed woodpecker (*Melanerpes erythrocephalus*) (SCB-03).

These habitats were identified to be provincially significant in the NHA, completed prior to the construction of the project. Provincial significance of habitats was identified based on criteria established by the MNRF.

Post-construction monitoring was not required at one Bat Maternity Colony Habitat (BMC-757) and one Amphibian Woodland Breeding Habitat (AWO-36) because infrastructure near these habitats was not constructed.

As per the Environmental Impact Study (EIS) report of the NHA and the EEMP (AECOM 2013, 2014), the following methods were implemented for the monitoring study:

- Acoustic through-the-night bat monitoring and evening visual bat surveys were conducted on at least 10 nights in June;
- Amphibian surveys were conducted during the spring, including:
 - Calling anuran (frog) surveys (once in each of April, May, and June);
 - Egg mass surveys targeting salamanders/newts (once in March and once in April); and
 - Larval surveys targeting salamanders/newts (once in late May or early June);

- Point count surveys for breeding great blue herons were conducted once in each of April and June;
- Point count surveys for breeding red-headed woodpeckers were conducted at least three times between late May and late June.

Results

Bat Maternity Colony Habitats

The results of the post-construction Bat Maternity Colony Habitat surveys completed by NRSI in 2017, in comparison with the baseline data collected from 2010-2011, are outlined in the table below.

Habitat ID	Pre-Construction Results (2010-2011)	Post-Construction Results (2015)	Post-Construction Results (2016)	Post-Construction Results (2017)
BMC-189	Significant Silver-haired Bat	Not Significant Does not meet standards of significance for any bat species	Significant Big Brown Bat Silver-haired Bat	Significant Big Brown Bat Silver-haired Bat
BMC-229	Significant Big Brown Bat Silver-haired Bat	Significant Big Brown Bat Silver-haired Bat	Significant Big Brown Bat Silver-haired Bat	Significant Big Brown Bat Silver-haired Bat
BMC-326	Significant Big Brown Bat Silver-haired Bat	Not Significant Does not meet standards of significance for any bat species	Significant Big Brown Bat Silver-haired Bat	Significant Big Brown Bat Silver-haired Bat
BMC-342	Significant Silver-haired Bat	Significant Big Brown Bat Silver-haired Bat	Not Significant Does not meet standards of significance for any bat species	Significant Big Brown Bat Silver-haired Bat

Amphibian Woodland Breeding Habitats

The results of the post-construction amphibian breeding (woodland) surveys completed by NRSI in 2017, in comparison with the baseline data collected in 2012 and 2013, are outlined below:

Habitat ID	Pre-Construction Results (2013)	Post-Construction Results (2015)	Post-Construction Results (2016)	Post-Construction Results (2017)
AWO-14	Significant ≥20 individuals, 2 frog species	Significant ≥20 individuals, 1 frog species	Not Significant <20 individuals, 1 frog species	Significant ≥20 individuals, 1 frog species
AWO-25	Significant ≥20 individuals, 2 frog species	Significant ≥20 individuals, 3 frog species	Significant ≥20 individuals, 3 frog species	Significant ≥20 individuals, 2 frog species
AWO-27	Significant ≥20 individuals, 2 frog species	Significant ≥20 individuals, 2 frog species	Significant ≥20 individuals, 1 frog species	Significant ≥20 individuals, 2 frog species
AWO-30	Significant ≥20 individuals, 2 frog species	Significant ≥20 individuals, 3 frog species	Significant ≥20 individuals, 2 frog species	Significant ≥20 individuals, 3 frog species
AWO-33	Significant	Significant	Significant	Significant

Habitat ID	Pre-Construction Results (2013)	Post-Construction Results (2015)	Post-Construction Results (2016)	Post-Construction Results (2017)
	≥20 individuals, 3 frog species	≥20 individuals, 3 frog species	≥20 individuals, 1 frog species	≥20 individuals, 3 frog species

Significant Bird Habitat Surveys

The results of the post-construction Colonially-Nesting Bird Breeding Habitat (Tree/Shrub) and Habitat for Species of Conservation Concern (Red-headed Woodpecker) surveys completed by NRSI in 2017, in comparison with the baseline data collected in 2013, are outlined below:

Habitat ID	Pre-Construction Results (2013)	Post-Construction Results (2015)	Post-Construction Results (2016)	Post-Construction Results (2017)
CNB-01	Significant At least 10 nest bowls At least 12 Great Blue Herons	Significant At least 14 nest bowls At least 7 Great Blue Herons	Not Significant At least 12 nest bowls No Great Blue Herons observed on nests	Not Significant At least 3 nest bowls No Great Blue Herons observed on nests
SCB-03	Significant Pair of adults, and adult on territory Nest observed	Significant Pair of adults observed entering nest and carrying food Juvenile observed in nest cavity	Significant Pair of adults observed entering nest and carrying food Juveniles were heard vocalizing	Significant Pair of adults observed, including 1 adult carrying food to the nesting cavity

Upon discovery that no great blue herons were using the delineated CNB-01 habitat in April of 2016, additional surveys were undertaken in May of that year to examine the habitat from other angles and scan other nearby habitats. A new, active colony of great blue herons was documented approximately 400m south/southeast of CNB-01, in the same contiguous treed habitat and located approximately the same distance from an operational turbine. This habitat was also monitored in 2017 to document its usage by great blue heron. In 2017, approximately seven (7) nests were observed, with confirmed use by up to eight (8) great blue herons.

Summary

Post-construction wildlife monitoring conducted by NRSI in 2017 represents the third year of post-construction monitoring conducted at the Goshen Wind Energy Centre.

There are no indications that the Goshen WEC is negatively affecting species abundance, habitat use, or species diversity at any of the significant wildlife habitats being monitored as part of this post-construction monitoring program.

Three (3) years of post-construction monitoring required by the EIS of the NHA and EEMP (AECOM 2013a, 2013c, 2013d, 2014) and the Renewable Energy Approval are now complete for each of the applicable significant wildlife habitats identified at the Goshen WEC.