NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Goshen Wind Energy Centre

2015 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 first year of post-construction wildlife monitoring conducted at the Goshen WEC in 2015.

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 Bat Maternity Colony habitats (BMC-189, BMC-229, BMC-326, BMC-342);
- Five Amphibian Woodland Breeding Habitats (AWO-14, AWO-25, AWO-27, AWO-30, AWO-33);
- One Colonially-Nesting Bird Breeding Habitat (Tree/Shrub) for nesting great blue herons (*Ardea herodias*) (CNB-01); and
- One 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 and early July;
- 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 or 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 three times between late May and early July.

Results

Bat Maternity Colony Habitats

The results of the post-construction Bat Maternity Colony Habitat surveys completed by NRSI in 2015, 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)
BMC-189	**Significant** Silver-haired Bat	**Not Significant** Does not meet standards of significance for any bat species
BMC-229	**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
BMC-342	**Significant** Silver-haired Bat	**Significant** Big Brown Bat Silver-haired Bat

The results observed at BMC-189 and BMC-326 indicates these habitats currently do not meet standards of provincial significance. Additional monitoring at these habitats will help to determine whether bat abundance at these habitats continues to be lower than pre-construction or if these passage rates reflect natural annual variation in local bat population abundance. Monitoring will continue for an additional two years at these (and all) significant bat habitats to observe any other variation in bat activity or species composition.

Amphibian Woodland Breeding Habitats

The results of the post-construction amphibian breeding (woodland) surveys completed by NRSI in 2015, in comparison with the baseline data collected in 2012 and 2013, are outlined below:

Habitat ID	Pre-Construction Results (2013)	Post-Construction Results (2015)
AWO-14	**Significant** ≥20 individuals, 2 frog species	**Significant** ≥20 individuals, 1 frog species
AWO-25	**Significant** ≥20 individuals, 2 frog species	**Significant** ≥20 individuals, 3 frog species
AWO-27	**Significant** ≥20 individuals, 2 frog species	**Significant** ≥20 individuals, 2 frog species
AWO-30	**Significant** ≥20 individuals, 2 frog species	**Significant** ≥20 individuals, 3 frog species
AWO-33	**Significant** ≥20 individuals, 3 frog species	**Significant** ≥20 individuals, 3 frog species

All significant amphibian woodland breeding habitats continue to meet the provincial standards for significance.

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 2015, in comparison with the baseline data collected in 2013, are outlined below:

Habitat ID	Pre-Construction Results (2013)	Post-Construction Results (2015)
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
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

All significant bird breeding habitats continue to meet the provincial standards for significance.

Additional Monitoring Commitments

Post-construction wildlife monitoring conducted by NRSI in 2015 represents the first year of post-construction monitoring conducted at the Goshen Wind Energy Centre.

Post-construction surveys are required to be conducted for two additional years for all significant wildlife habitats in the Goshen WEC project area. Surveys will be conducted in 2016 and 2017 for the following habitats, in accordance with the EIS of the NHA and EEMP (AECOM 2013, 2014):

- Bat Maternity Colony Habitats (BMC-189, BMC-229, BMC-326, BMC-342);
- Amphibian Woodland Breeding Habitats (AWO-14, AWO-25, AWO-27, AWO-30, AWO-33);
- Colonially-Nesting Bird Breeding Habitat (Tree/Shrub) (CNB-01); and
- Habitat for Species of Conservation Concern (Red-headed Woodpecker) (SCB-03).