



Biodiversity Studies • Wetland Delineation & Assessment • Habitat Management • GIS Mapping • Permitting

2018 Bird and Bat Fatality Monitoring Results

Colebrook South Wind Energy Facility
Flagg Hill Road, Colebrook

Submitted To:

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INTRODUCTION

BNE Energy Inc. (BNE) operates the Colebrook South Wind Energy Facility in northeastern Litchfield County, Connecticut. The project is located at 17 and 29 Flagg Hill Road in Colebrook, CT and currently contains two 2.85 megawatt (MW) GE wind turbines at 322-foot hub heights with three 165-foot rotor blades (see *Figure 1 – Site Location Map* and inset below).

Under the conditions of the project approval set forth by the Connecticut Siting Council (CSC), BNE was required to monitor the project site for turbine-related bird and bat fatalities for a period of three years. BNE contracted with Davison Environmental LLC (DELLC) to conduct this fatality monitoring.



Aerial photograph (2016) showing Turbines 1 and 2 with surrounding cleared areas.

STUDY OBJECTIVES

The State of Connecticut does not currently have guidelines for studying the impacts of wind energy projects on wildlife. Therefore, DELLC has developed the following survey protocol based on a review of Strickland et. al., 2011. The objectives of the post-construction fatality monitoring study are:

1. To assess the level of bird and bat mortality attributable to collisions with wind turbines on an annual basis.
2. To provide a general understanding of the factors associated with the timing, extent, species composition, distribution, and location of the fatalities found.

Note that this protocol does not include statistical analysis of the data, which might include adjusted fatality estimates through consideration of factors such as searcher efficiency and carcass removal rates, but rather is focused strictly on inventory of bird and bat carcasses found at the project site.

METHODS

The specific survey methodology employed is described in the report entitled *Bird and Bat Fatality Monitoring Protocol* prepared by DELLC dated June 2, 2016. The extent of forest clearing surrounding the two turbines was mapped in the field. The cleared areas were divided into three search grids at the south turbine (T-1) and four search grids at the north turbine (T-2). Previous studies indicate that mortality may be highest near the base of the turbines, and therefore the search grids were designed to cover all cleared areas immediately surrounding the turbines as well as all available cleared areas beneath the length of the rotor blades. Given the density of ground and shrub cover present in the forest adjacent to the existing clearings, the search areas do not extend into forested areas around the turbines.

Each search grid was walked by an observer in parallel tracks with a 20-foot offset. The vegetation within the search area is herbaceous meadow. Therefore, it was assumed that the observer could readily observe a carcass within 10 feet in grass that has a maximum height of approximately one to two feet.

Standardized carcass searches were conducted at both turbines once per week beginning on April 20th and terminating on October 30th, 2017, for a total of 26 searches. The condition of each bird or bat carcass found was recorded as:

- Intact - a carcass that is completely intact, is not badly decomposed, and shows no sign of being scavenged;
- Scavenged - a carcass that shows signs of being scavenged, a portion(s) of a carcass in one location (e.g., wings, skeletal remains, portion of a carcass, etc.), or a carcass that has been heavily infested by insects; or
- Feather spot - ten or more feathers or two or more primary feathers in one location.

All casualties found were labeled "CS" and numbered consecutively. The following data were collected: species; date and time collected; Global Positioning System (GPS) coordinates; condition and any comments that indicate possible cause of death. Photographs of the casualties were taken *in situ*.

RESULTS

A total of three (3) bird mortalities were observed. Additionally, a single feather spot was observed. Mortalities are summarized in Tables 1 and illustrated on *Figure 2 – Bird Mortalities*. No bat mortalities were observed in 2018. Table 1 shows the mortalities observed by survey date, including the turbine where the carcasses were observed.

<i>Table 2: Summary of bat and bird mortalities including date and turbine location</i>					
Date	Type	Turbine Location	Code	Scientific Name	Common Name
05/14/18	Intact	T2	CS1	<i>Vireo olivaceus</i>	Red-eyed vireo
06/20/18	Feather Spot	T1	CS2	NA	NA
06/27/18	Intact	T2	CS3	<i>Vireo olivaceus</i>	Red-eyed vireo
06/27/18	Intact	T2	CS4	<i>Vireo olivaceus</i>	Red-eyed vireo

Searches were conducted under fair weather conditions. Table 2 summarizes the weather and search time for each survey. The search area was maintained as a grass-dominated meadow throughout the survey period. Vegetation height ranged from bare ground to a maximum of approximately 24 inches, but averaged approximately 10 inches.

<i>Table 2: site visit summary including date, search time and weather</i>					
Search Date	Start Time	End Time	Weather	% Cloud Cover	Temperature (F)
4/20/18	11:00	15:20	Clear	<10	50
4/29/18	13:30	18:10	P. Cloudy	40	52
5/07/18	16:30	19:10	Clear	<10	71
5/14/18	16:10	19:20	Clear	<10	72
5/22/18	16:00	19:00	Cloudy	80	62
5/28/18	16:30	19:20	Clear	<10	68
6/06/18	16:40	19:40	Clear	20	69
6/11/18	16:00	19:10	P. Cloudy	40	73
6/20/18	16:20	19:20	Clear	<10	80
6/27/18	16:00	19:10	P. Cloudy	50	71
7/5/18	12:00 pm	2:00 pm	Mostly sunny	25	80
7/13/18	12:00 pm	3:00 pm	Sunny	0	80
7/20/18	12:00 pm	3:00 pm	Mostly sunny	25	80
7/29/18	10:00 am	2:00 pm	Mostly sunny	25	75
8/6/18	12:00 pm	3:30 pm	Sunny	0	85

<i>Table 2 continued....</i>					
Search Date	Start Time	End Time	Weather	% Cloud Cover	Temperature (F)
8/15/18	11:00 am	2:30 pm	Mostly sunny	25	80
8/21/18	11:00 am	3:00 pm	Partly sunny	50	70
8/27/18	10:30 am	2:00 pm	Mostly sunny	25	80
9/5/18	12:00 pm	2:30 pm	Partly cloudy	25	82
9/13/18	11:00 am	2:00 pm	Overcast	100	70
9/21/18	11:00 am	1:30 pm	Overcast	100	68
9/29/18	12:40pm	2:30pm	Partly sunny	30	62
10/5/18	12:00 pm	2:30 pm	Sunny	0	58
10/12/18	12:00 pm	3:00 pm	Mostly cloudy and windy	75	56
10/21/18	10:30 am	2:00 pm	Overcast and windy	100	40
10/30/18	11:00 am	3:30 pm	Mostly cloudy	75	40

REFERENCES

Strickland, M.D., E.B. Arnett, W.P. Erickson, D.H. Johnson, G.D. Johnson, M.L., Morrison, J.A. Shaffer, and W. Warren-Hicks. 2011. *Comprehensive Guide to Studying Wind Energy/Wildlife Interactions*. Prepared for the National Wind Coordinating Collaborative, Washington, D.C., USA.

Appendices

(1) Figures

- Figure 1 – Site Location Map
- Figure 2 – Bird Mortalities

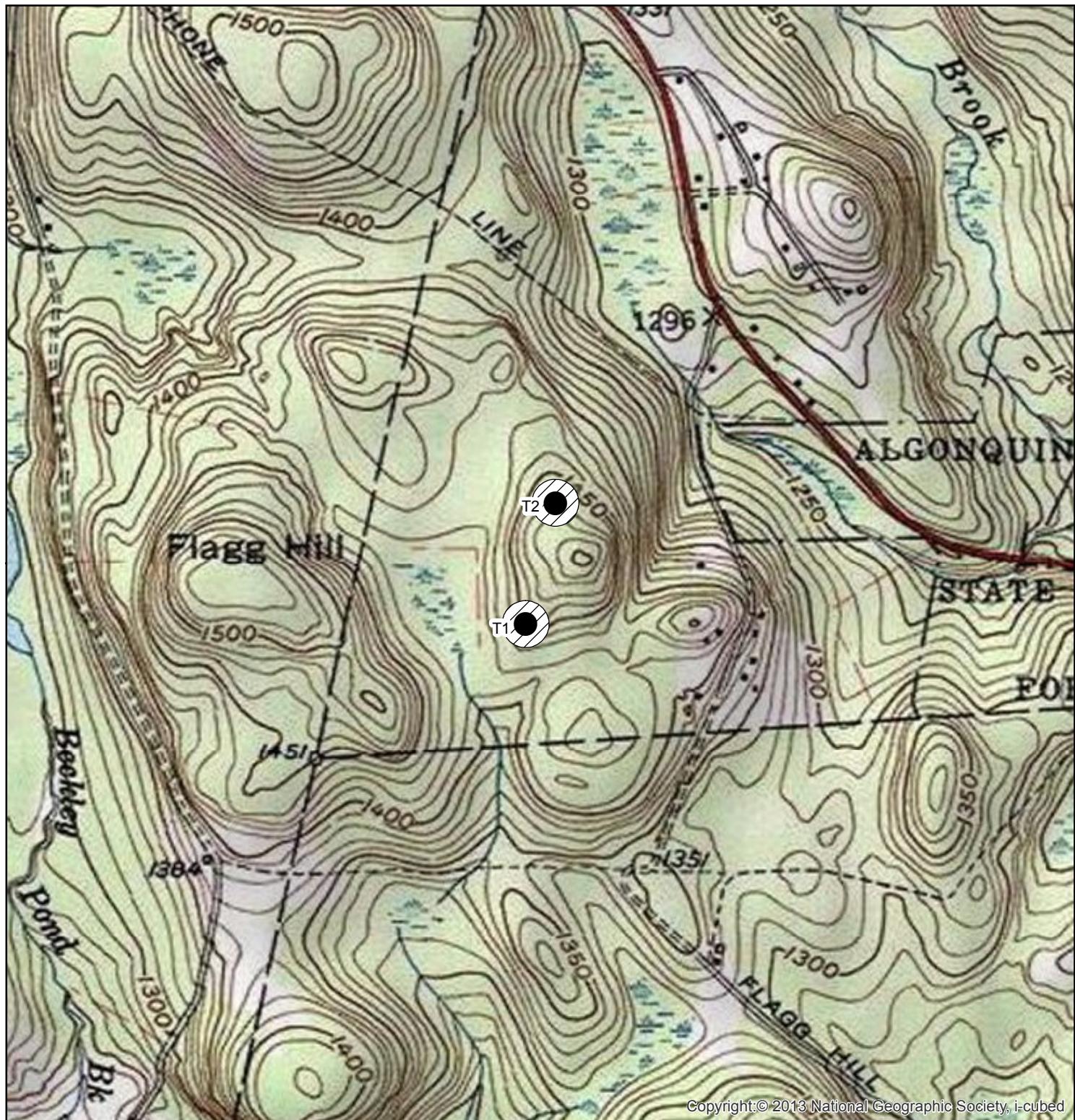


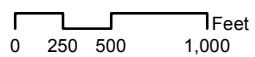
FIGURE 1:
Location Map

Turbines
 Turbine Coverage

Map Description

Topographic Map (USGS) showing the approximate location of Colebrook South turbines.

SCALE


 0 250 500 1,000 Feet



NOTE: This map is intended for illustrative purposes only. It contains no authoritative data.

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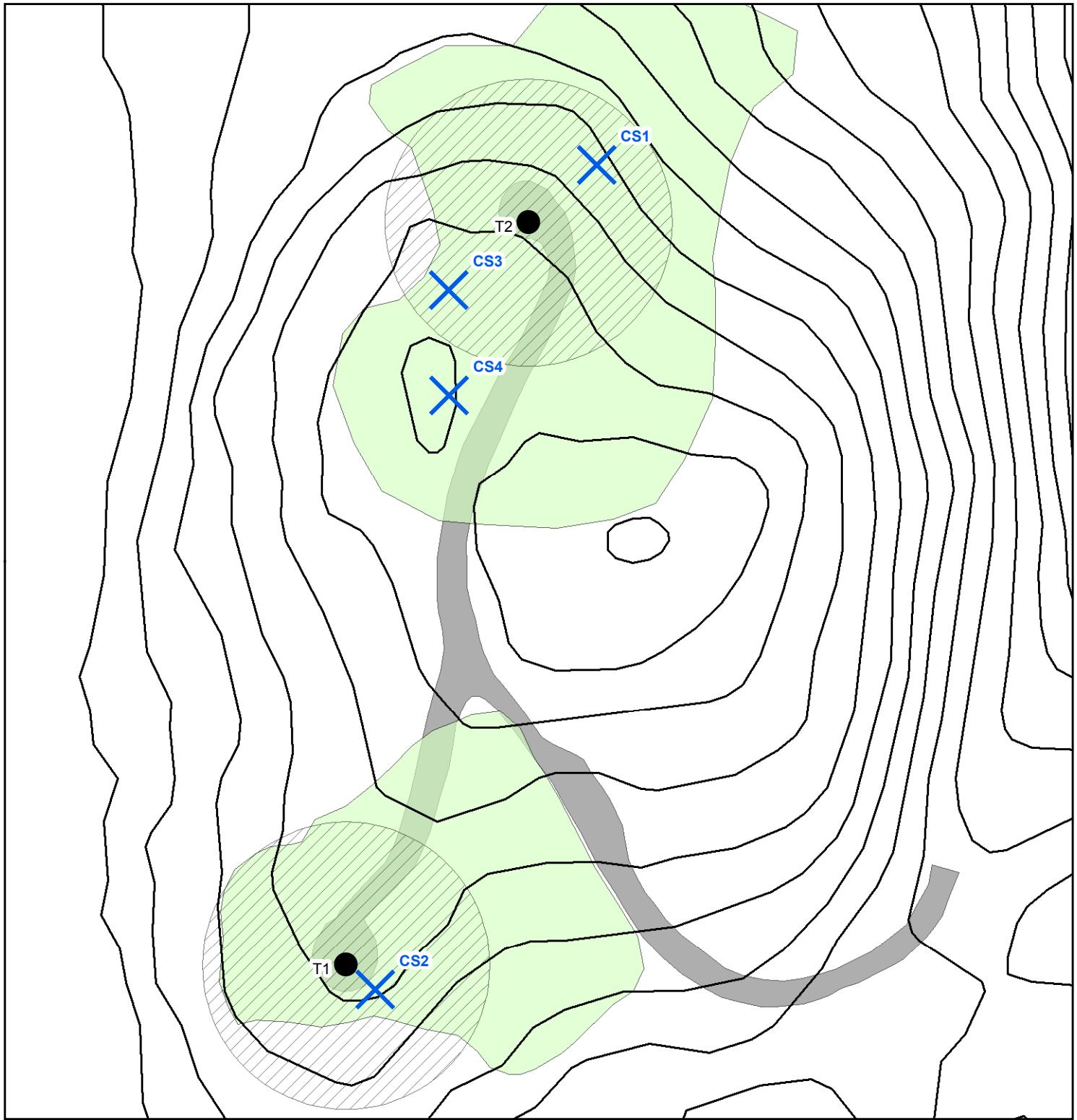


FIGURE 2:
Bird Mortalities

Map Description

Colebrook South Bird Mortalities
April 20th - October 30th, 2018. Data as
collected by Davison Environmental.
Location data recorded with <3 meter
accuracy. Additional data from CT DEEP
Topographic Contours and Political
Boundaries datasets.

● Turbines

✗ Bird

▨ Turbine Coverage

— 10 FT Contour

■ Search Areas

■ Access Road

SCALE

0 37.5 75 150 Feet



NOTE: This map is intended for illustrative purposes only. It
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