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July 13, 2018

VIA ELECTRONIC FILING

Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: PETITION NO. 983 – 2017 BIRD AND BAT FATALITY MONITORING RESULTS.

Dear Ms. Bachman:

BNE Energy Inc. hereby respectfully submits the 2017 Bird and Bat Fatality Monitoring Results for the Wind Colebrook South wind project consisting of two GE Energy (“GE”) 2.85-megawatt (“MW”) wind turbines with 98.3 meter hub heights and 103 meter diameter blades located at 29 Flagg Hill Road and 17 Flagg Hill Road in Colebrook, Connecticut.

The 2017 monitoring results indicate that there were a total of nine observed mortalities consisting of two bats and seven birds. This is a 50% reduction from the total observed mortalities of eighteen in 2016 consisting of ten bats and eight birds. The results are also significantly below the predicted average expected fatality rate of 113 bats and 40 birds per year based on the bird and bat studies that were done for the site.

Please do not hesitate to contact me if you have any questions.

Very truly yours,

Paul J. Corey
Chairman

Enclosure



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

2017 Bird and Bat Fatality Monitoring Results

Colebrook South Wind Energy Facility

Flagg Hill Road, Colebrook

Submitted To:

Paul Corey
BNE Energy Inc.
17 Flagg Hill Road
Colebrook, CT 06021

Prepared By:

A handwritten signature in blue ink that reads "Eric Davison".

Eric Davison
Wildlife Biologist
Davison Environmental, LLC

April 2, 2018

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 extent 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 12th and terminating on October 25th, 2017, for a total of 29 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 where 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 nine (9) mortalities were observed including 2 bats and 7 birds. Mortalities are summarized in Tables 1 and 2 and illustrated on *Figure 2 – Bat Mortalities*, *Figure 3 – Bird Mortalities* and *Figure 4 – Mortalities (All Species)*.

Two bat species were observed; big brown bat (1 mortality) and hoary bat (1 mortality). Bat carcasses were bagged, labeled and placed in a freezer on the property.

Three bird species were observed; chestnut-sided warbler (1 mortality), rose-breasted grosbeak (1 mortality) and red-eyed vireo (3 mortalities). There were also two unknown bird mortalities observed (1 scavenged & 1 feather spot). With the exception of these mortalities, CS5 & CS9, all mortalities were assumed to be attributable to turbine collision.

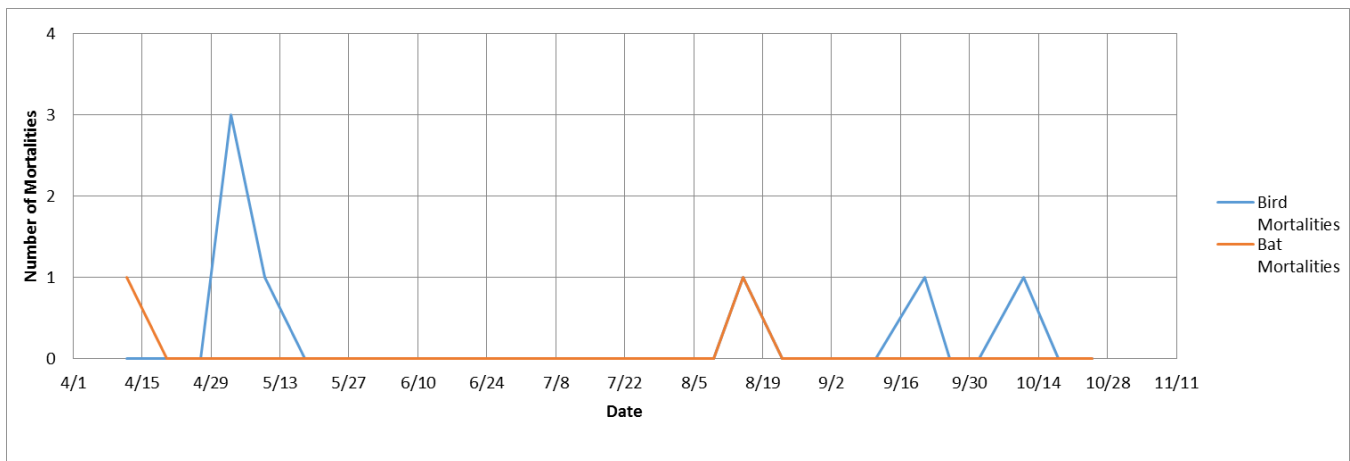
Most mortalities occurred at Turbine #1, with a total of six (all birds). Both bat mortalities and one bird mortality occurred at Turbine #2. All but two mortalities were found near the turbines and within the 338-foot diameter travel path of the rotor blades.

Table 1 lists mortalities CS1 through CS9 by species. The most common bird species observed was the red-eyed vireo (n=3).

<i>Table 1: Summary of bat and bird mortalities by species</i>		
Scientific Name	Common Name	Code
Bat Mortalities		
<i>Eptesicus fuscus</i>	Big brown bat	CS1
<i>Lasiurus cinereus</i>	Hoary bat	CS7
Bird Mortalities		
<i>Pheucticus ludovicianus</i>	Rose-breasted grosbeak	CS4
<i>Setophaga pensylvanica</i>	Chestnut-sided warbler	CS2
<i>Unknown</i>	Scavenged Passerine	CS5
<i>Unknown</i>	Feather Spot	CS9
<i>Vireo olivaceus</i>	Red-eyed vireo	CS3
<i>Vireo olivaceus</i>	Red-eyed vireo	CS6
<i>Vireo olivaceus</i>	Red-eyed vireo	CS8

Table 2 shows the mortalities observed by survey date, including the turbine where the carcasses were observed. The mortalities were charted by date and show that bird mortalities were found from July through October and bat mortalities were found from April through August.

Date	Type	Turbine Location	Code	Scientific Name	Common Name
4/12/2017	Bat	T2	CS1	<i>Eptesicus fuscus</i>	Big Brown Bat
5/3/2017	Bird	T2	CS2	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak
5/3/2017	Bird	T1	CS3	<i>Setophaga pensylvanica</i>	Chestnut sided warbler
5/3/2017	Bird	T1	CS4	<i>Vireo olivaceus</i>	Red-eyed vireo
5/10/2017	Bird	T1	CS5	<i>Unknown</i>	Passerine
8/15/2017	Bat	T2	CS6	<i>Lasionycteris noctivagans</i>	Hoary bat
8/15/2017	Bird	T1	CS7	<i>Vireo olivaceus</i>	Red-eyed vireo
9/21/2017	Bird	T1	CS8	<i>Vireo olivaceus</i>	Red-eyed vireo
10/11/2017	Bird	T1	CS9	<i>Unknown</i>	Unknown



Searches were conducted under fair weather conditions. Table 3 summarizes the weather and search time for each survey. The search area was maintained as meadow throughout the survey period (see site photographs in the appendix). Grass height ranged from bare ground to a maximum of approximately 24 inches, but average between 6 and 12 inches.

Table 3: site visit summary including date, search time and weather

Search Date	Start Time	End Time	Weather	% Cloud Cover	Temperature (F)
4/12/2017	7:45	11:15	Overcast	90	63
4/20/2017	9:00	12:10	Overcast	90	58
4/27/2017	10:30	13:30	Misting	100	68
5/3/2017	10:30	14:00	M. Cloudy	70	59
5/10/2017	10:50	14:00	M. Cloudy	80	54
5/18/2017	8:50	12:00	Clear	5	86
5/24/2017	10:00	13:10	Overcast	95	70
5/30/2017	9:50	13:00	Misting	100	56
6/8/2017	13:30	16:00	M. Cloudy	70	76
6/15/2017	11:20	14:35	M. Sunny	20	78
6/22/2017	9:30	12:50	Clear	10	81
6/29/2017	11:40	14:30	M. Cloudy	80	83
7/5/2017	11:00	13:50	M. Sunny	30	81
7/13/2017	9:50	13:15	M. Cloudy	75	82
7/19/2017	10:50	13:30	M. Clear	10	83
7/26/2017	10:00	14:10	Clear	20	82
8/2/2017	10:30	13:45	P. Cloudy	40	81
8/9/2017	11:00	14:10	Clear	5	78
8/15/2017	14:30	17:40	Misting	100	74
8/23/2017	8:55	12:00	M. Clear	15	68
8/31/2017	14:40	17:30	P. Cloudy	45	70
9/7/2017	14:30	17:30	P. Cloudy	35	68
9/11/2017	13:40	16:30	Misting	25	76
9/21/2017	14:40	17:50	Overcast	90	72
9/26/2017	10:00	13:10	Clear	20	79
10/2/2017	11:00	14:00	Clear	5	72
10/11/2017	11:20	14:30	M. Sunny	20	81
10/18/2017	12:20	15:30	M. Sunny	20	73
10/25/2017	11:20	14:00	P. Cloudy	60	67

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 – Bat Mortalities
- Figure 3 – Bird Mortalities
- Figure 4 – Mortalities (all species)

(2) Site Photographs

Figures



- Figure 1 – Site Location Map
- Figure 2 – Bat Mortalities
- Figure 3 – Bird Mortalities
- Figure 4 – Mortalities (all species)



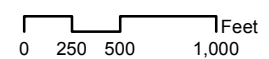
FIGURE 1:
Location Map

Map Description

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

-  Turbines
-  Turbine Coverage

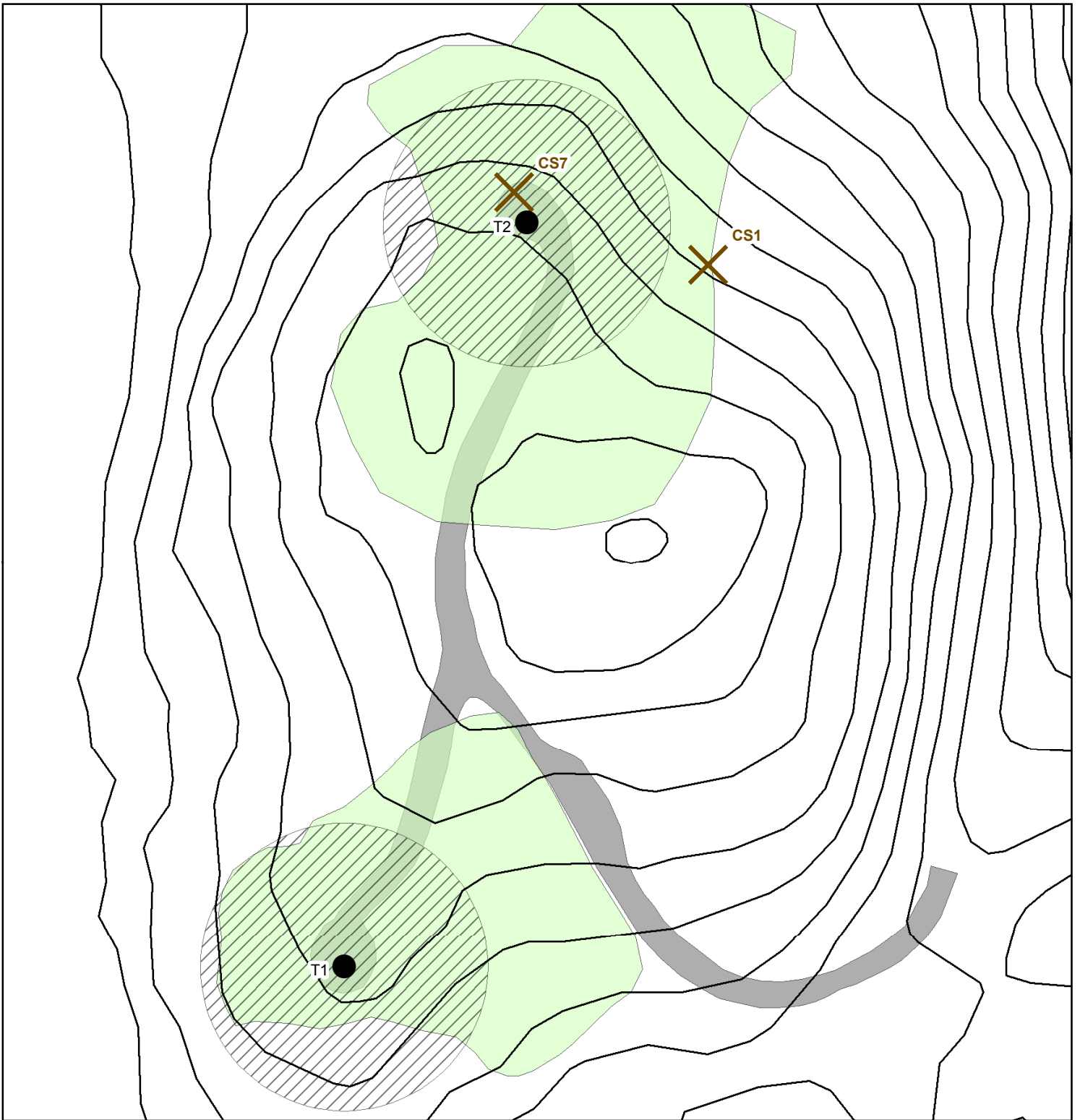
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


Davison Environmental, LLC
10 Maple Street
Chester, CT 06412
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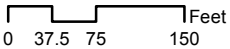

NOTE: This map is intended for illustrative purposes only. It contains no authoritative data.



**FIGURE 2:
Bat Mortalities**

- | | |
|--|---|
|  Turbines |  10 FT Contour |
|  Turbine Coverage |  Search Areas |
|  Bat |  Access Road |

SCALE

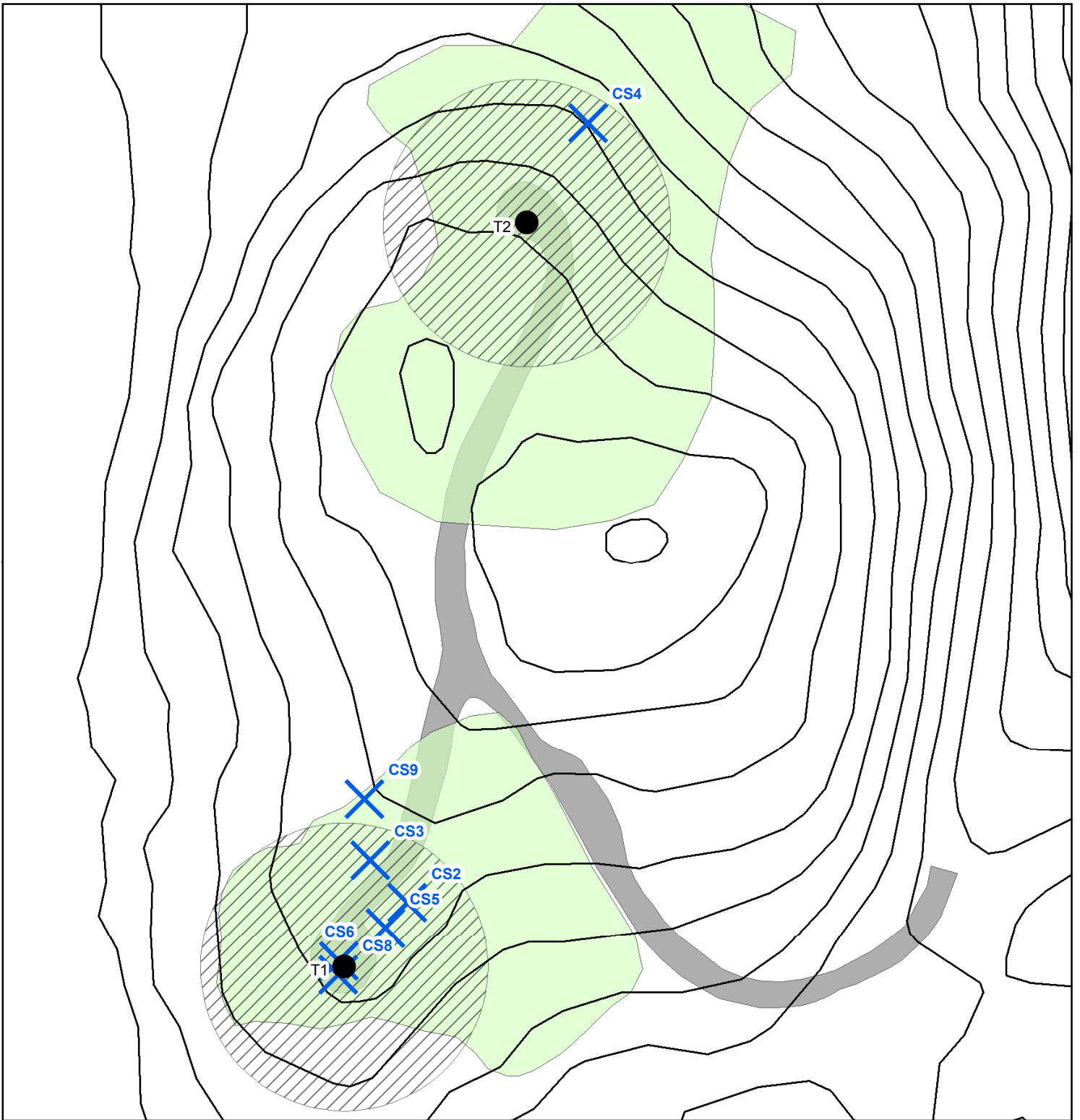
Map Description

Colebrook South Bat Mortalities
 April 12th - August 15th, 2017. Data as
 collected by Davison Environmental.
 Location data recorded with <3 meter
 accuracy. Additional data from CT DEEP
 Topographic Contours and Political
 Boundaries datasets.

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

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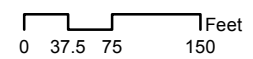
**FIGURE 3:
Bird Mortalities**

Map Description

Colebrook South Bird Mortalities
 May 3rd - October 11th, 2017. 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
- Turbine Coverage
- Bird
- Search Areas
- Access Road
- 10 FT Contour

SCALE



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

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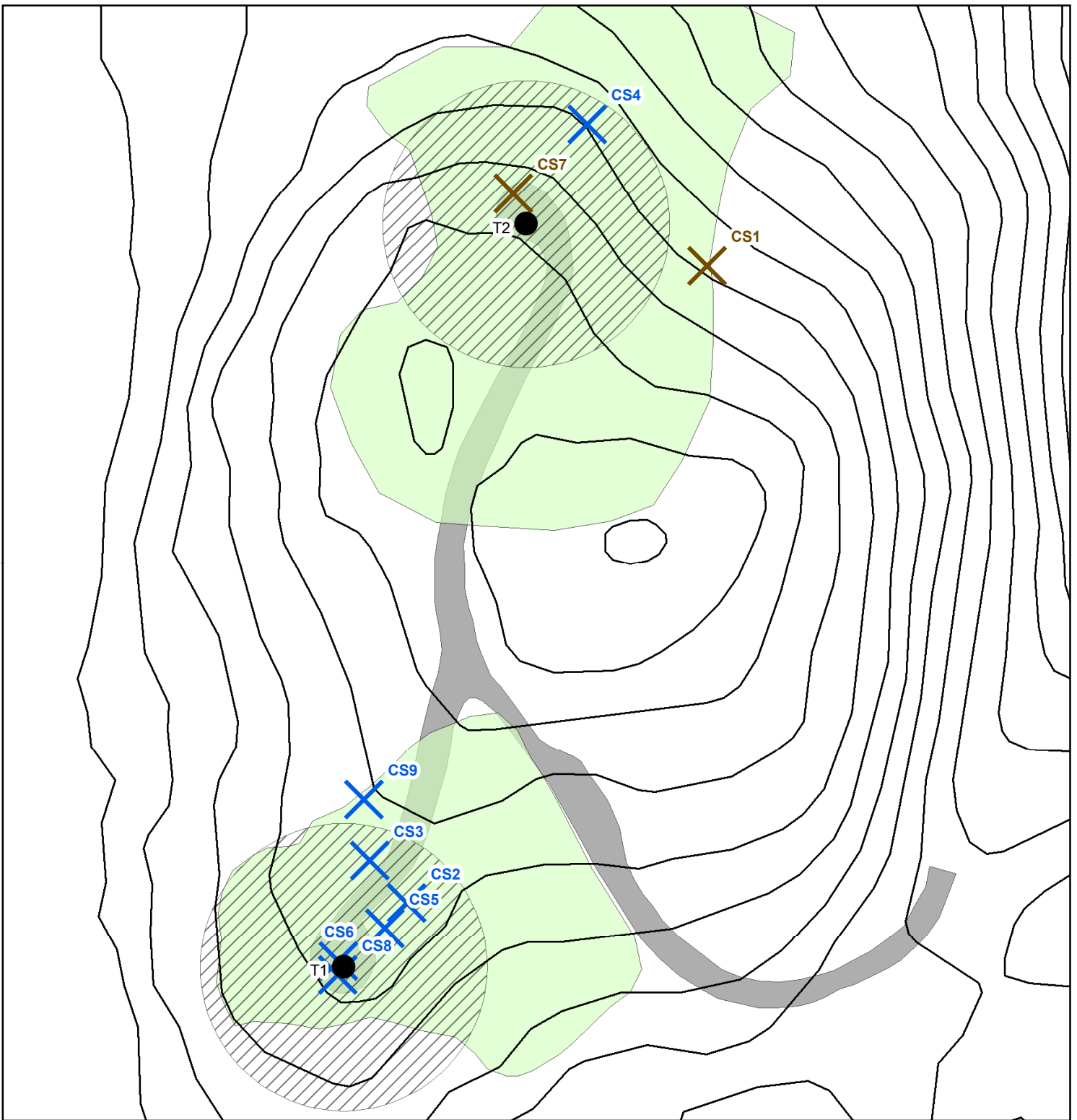









FIGURE 4:
Mortalities (All species)

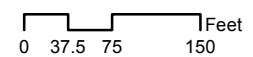
Map Description

Colebrook South Mortalities
 April 12th - October 11th, 2017. 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 |  | Search Areas |
|  | Turbine Coverage |  | Access Road |
|  | Bird |  | 10 FT Contour |
|  | Bat | | |

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

SCALE



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Site Photographs



4/20/2017



4/27/2017

April Site Conditions: Early spring conditions.



05/03/2017



5/24/2017

May Site Conditions: Some areas to the east of T2 mowed and rows of conifer saplings planted.



06/15/2017



06/29/2017

June Site Conditions: Areas to the east of T2 were mowed.



07/05/2017



07/26/2017

July Site Conditions: Areas to the east and west of T2 were mowed.



08/09/2017



08/31/2017

August Site Conditions: Areas to the south, east and west of T1 were mowed. Area to the northwest of T2 was mowed.



09/07/2017



09/26/2017

September Site Conditions: Area to the south of T1 was mowed.



10/02/2017



10/25/2017

October Site Conditions: Hill to the east of T2 was mowed.