



**DRAFT**

***Gunn's Hill Wind Farm***  
**2017 Post-Construction Mortality**  
**Monitoring Report**

Prepared for:  
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**NATURAL RESOURCE SOLUTIONS INC.**

Aquatic, Terrestrial and Wetland Biologists

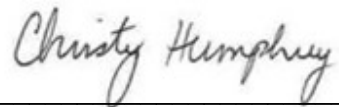
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2017 Post-construction Mortality Monitoring Report**

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## Executive Summary

Natural Resource Solutions Inc. was retained to conduct 3 years of post-construction monitoring at the operational Gunn's Hill Wind Farm, located within the Township of Norwich and the City of Woodstock, Oxford County, Ontario. This wind energy project has a generating capacity of 18MW and consists of 10 turbines situated in an agricultural landscape dominated by row crops. Occasional wooded habitats, wetlands, and aquatic features are also present in the areas surrounding the project infrastructure. This report provides the detailed methods and results from the first year of post-construction monitoring for bird and bat mortality conducted at the Gunn's Hill Wind Farm in 2017.

During twice-weekly searches from May 1 to October 31, 2017, a total of 7 bird mortalities were documented within the search areas around the 10 turbines. Observed bird mortalities consisted mostly of landbird species that are considered common in the province. Using appropriate correction factors, an estimated bird mortality rate of 1.03 birds/turbine/year (0.57 birds/MW/year), as calculated by turbine group, was determined for the Gunn's Hill Wind Farm. This is below the provincial threshold of 14 birds/turbine/year at turbine groups. No significant bird mortality events were documented.

During twice-weekly searches from May 1 to October 31, 2017, and once-weekly searches in November, a single raptor mortality was documented. This raptor, a red-tailed hawk (*Buteo jamaicensis*), is considered a common species in the province. This resulted in an estimated raptor mortality rate of 0.10 raptors/turbine/year or (0.06 raptors/MW/year). This is below the provincial threshold of 0.20 raptors/turbine/year.

During twice-weekly searches from May 1 to October 31, 2017, a total of 68 bat mortalities were documented within the search areas around the 10 turbines. Bat mortalities of both long-distance migratory and resident species were documented, including mortalities of hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), and big brown bat (*Eptesicus fuscus*). The first 3 species above are considered long-distance migratory species which over-winter outside of Ontario, and combined to account for 84% of the total bat mortality observations at the Gunn's Hill Wind Farm in 2017. Using appropriate correction factors, an estimated bat mortality rate of 10.81 bats/turbine/year (5.99 bats/MW/year) was determined for the Gunn's Hill Wind Farm. This is above the provincial threshold of 10 bats/turbine/year.

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## 1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained to conduct the first year of post-construction monitoring at the operational Gunn's Hill Wind Farm (Gunn's Hill WF), which is located within the Township of Norwich and the City of Woodstock, Ontario. The Gunn's Hill WF consists of 10 operational wind energy generating turbines with a total nameplate capacity of 18MW. The project area and turbine locations can be seen on Map 1.

Post-construction monitoring at the Gunn's Hill WF in 2017 included bird, bat, and raptor mortality monitoring, searcher efficiency trials, scavenger removal trials, and visibility class mapping of substrates searched. These surveys were conducted in accordance with provincial guidelines and approval conditions of the project to assess the potential impacts of this wind energy generating facility on local and migratory birds and bats.

The purpose of this report is to provide the detailed methods and results from the first year of post-construction mortality monitoring conducted at the Gunn's Hill WF.

For the purposes of this report, NRSI will frequently use the terms 'mortality' and 'carcass'. The term 'mortality' will refer to dead birds and bats that were found in the vicinity of turbines at the Gunn's Hill WF. The term 'carcass' will refer to dead birds and bats that have been placed beneath wind turbines by NRSI staff for the purposes of searcher efficiency and/or scavenger removal trials.

In addition, an environmental monitor from Haudenosaunee Development Institute (HDI) was retained by Prowind Canada Inc. This HDI environmental monitor accompanied the NRSI biologist during the monitoring surveys and assisted with the searches from May to October, and as a result, they are referred to herein as the "search team", where applicable.

## 2.0 Mortality Monitoring Methodology

### 2.1 Mortality Monitoring

#### 2.1.1 Sample Locations

For wind energy projects consisting of less than 10 turbines, all turbines are required to be monitored (OMNR 2011a, OMNR 2011b). In accordance with these requirements, mortality monitoring was conducted at all 10 turbines in 2017, following the monitoring period and search frequency described below.

#### 2.1.2 Monitoring Period and Search Frequency

The search team conducted twice-weekly (3 and 4 day intervals) mortality monitoring at each of the 10 turbines during the entire monitoring period of May 1 to October 31, 2017. Raptor mortality monitoring was conducted by NRSI biologists once-weekly at all turbines throughout the month of November.

As a result of turbine maintenance, some turbines could not be searched on particular dates. These relatively minor adjustments to the monitoring protocol are not expected to impact the results or conclusions presented in this report. The dates when turbines were not able to be searched are listed below in Table 1.

**Table 1. Summary of Regular Search Days When Turbines Could Not be Searched (2017)**

Date (2017)	Turbine(s)	Rationale
May 19	T10	Turbine Maintenance
June 20	T07	Turbine Maintenance
June 27	T06	Turbine Maintenance

#### 2.1.3 Sample Area and Survey Duration

Mortality searches were conducted within a 50m radius of each turbine base, using circular transects of increasing diameter around the turbine base, spaced approximately 5m apart. In order to maintain a consistent search effort, mortality searches followed a consistent search time of 20 minutes per turbine throughout the monitoring season. As a team consisting of 2 searchers conducted the surveys from May 1 to October 31, this search time is equivalent to 40 minutes per turbine of person-effort during each search event during the monitoring period.

#### 2.1.4 Data Collection

During each visit to conduct mortality searches, all appropriate information was documented, including weather conditions, date, time and observers. The mortality monitoring data sheet has been provided in Appendix I.

In addition to general information collected on each visit, a variety of specific information was recorded upon encountering any mortality. This detailed information, as shown on the data sheet provided in Appendix I, included species (if identifiable), sex, condition code, estimated time since death, any apparent injuries, direction and distance from turbine base, substrate type and visibility class, and a unique mortality identification number for future reference. Specific UTM coordinates and photographs were also taken for each specimen to allow for further analysis, if necessary.

#### 2.2 Scavenger Removal Trials

Scavenger removal trials were conducted in each of the spring, summer and fall seasons of mortality monitoring. For the purposes of this monitoring program, the spring monitoring season is defined as the months of May and June, the summer monitoring season is July and August, and the fall season is September and October. A minimum of 10 carcasses were placed in each monitoring season. No more than 5 carcasses were placed at one time and no more than 1 carcass was placed at any single turbine during each placement event. These measures were taken to avoid bias in the trial resulting from saturation of carcasses available to scavengers. Carcasses were placed throughout the range of habitats and substrate types being searched during each season. Species, UTM coordinates, direction and distance from turbine base, substrate and visibility class were all noted on a data sheet during the placement of each specimen. The scavenger removal data sheet has been provided in Appendix I.

Carcasses placed included both bird and bat specimens, with each trial consisting of at least one-third representation of each of bird and bat carcasses. Bird carcasses included species commonly encountered in this region of the province and ranged in size from very small to moderately-sized carcasses. Long-distance migratory bat carcasses were used in each seasonal scavenger removal trial and included hoary bat (*Lasiurus cinereus*), eastern red bat (*Lasiurus borealis*) and silver-haired bat



(*Lasionycteris noctivagans*). Carcasses used in scavenger removal trials were obtained from the Royal Ontario Museum and/or were collected from operational wind energy facilities within Ontario. A list of all of the bird and bat species used during scavenger removal trials has been provided in Appendix II.

During each scavenger removal trial, the bird and bat carcasses were left for up to 14 days and were checked at the same frequency as mortality searches, or approximately twice per week, to note any scavenging or signs of scavenger presence. Following the completion of the scavenger removal trials after 14 days, all remaining test carcasses were retrieved and disposed of appropriately.

### 2.3 Searcher Efficiency Trials

In conjunction with mortality searches, NRSI conducted searcher efficiency trials on searchers, or search teams, that conducted mortality searches at the Gunn's Hill WF. Similar to scavenger removal trials, searcher efficiency trials must be conducted at least once per season, and on each searcher/search team and in each visibility class that was searched during that season. In order to obtain more accurate results and to account for seasonal changes in groundcover, weather, or soil saturation, NRSI conducted monthly searcher efficiency trials from May to October. During each trial, searchers were tested without their knowledge through the placement of a minimum of 10 test carcasses per visibility class searched (class 1) with no more than 3 carcasses placed on any one date. Carcasses were placed randomly within the search radius of each of the 10 turbines at the Gunn's Hill WF. Distance and direction from turbine base, visibility class and substrate type, and UTM coordinates were recorded for each test carcass placed. Each found specimen was later compared to the total number of carcasses placed within the project area, the locations of their placement, and species placed. The data sheet used for searcher efficiency trials can be seen in Appendix I.

In order to discreetly mark carcasses while minimizing human influence, NRSI marked the trial carcasses by using a combination of identifying the UTM coordinates, distance and direction from the turbine, species, and location on a field map. Each of these steps is used to clearly mark the location and attributes of the trial carcass for future reference,

should there be any uncertainty about whether or not the observed carcass is a turbine-related fatality.

Searcher efficiency carcasses included both bird and bat specimens, with each trial consisting of at least one-third representation of each of bird and bat carcasses. Bird carcasses included species commonly encountered in this region of the province and varied in size from very small to moderate-sized carcasses. Bat carcasses used during searcher efficiency trials consisted of the 3 long-distance migratory species known to occur within Ontario, including hoary bat, eastern red bat, and silver-haired bat. Carcasses used in searcher efficiency trials were obtained from the Royal Ontario Museum and/or were collected from operational wind energy facilities within Ontario. A list of all of the bird and bat species used during searcher efficiency trials has been provided in Appendix III.

#### 2.4 Proportion of Area Searched

Following Ministry of Natural Resources and Forestry (MNRF) guidelines, visibility class maps were completed by searchers at a minimum frequency of once per season (OMNR 2011a, OMNR 2011b). Due to the potential for changing conditions, NRSI completed visibility class maps once per month from May to October to provide additional information to support whether more frequent searcher efficiency trials were warranted, and ultimately to increase the accuracy of the estimated mortality rates.

Visibility class mapping was completed for the full 50m search radius at each turbine. This mapping categorized habitats according to visibility classes recommended by the MNRF (OMNR 2011a, OMNR 2011b). These include visibility classes 1 through 4, in addition to areas which may be deemed “unsearchable”, such as wooded areas, areas deemed safety hazards, or other areas where searching was not possible. Mapping of these visibility classes within each turbine’s search radius was conducted and calculated as per a repeatable methodology using a combination of these visibility class field maps, review of aerial photographs, and Geographic Information System (GIS) software. The data sheet used to record visibility class mapping has been provided in Appendix I.

In order to help increase the accuracy of searcher efficiency rates and minimize the influence of the proportion of area searched on the bird and bat mortality estimates, the 50m search radii at each of the 10 turbines were maintained at visibility class 1 through occasional plowing for the duration of the monitoring year (May through November), when necessary. When small and temporary areas of other visibility classes were present, they were searched thoroughly until scheduled vegetation maintenance could occur. As a result, the majority of the 50m radius at each turbine was searched for the duration of the 2017 monitoring period. Some areas were determined to be visibility classes that were not searched as part of this monitoring program (i.e. visibility classes 2-4). In these cases, the appropriate proportion of area searched was calculated and used for final mortality estimates. Visibility class maps of each turbine in each month are provided in Appendix VII.

Maintenance of the 50m search radius was only completed when necessary to maintain appropriate visibility and it also followed a strict schedule developed by NRSI that ensured the maintenance activities were completed in a manner to minimize or eliminate any potential negative influence on the mortality monitoring, searcher efficiency trials and scavenger removal trials. The maintenance of the search areas is expected to increase the accuracy of the final estimated mortality rates at the Gunn's Hill WF.

### 3.0 Scavenger Removal Trial Results

Scavenging activity at the Gunn's Hill WF was low to moderate throughout the monitoring seasons, with a slight increase in scavenging activity documented during the summer trial. Table 2 shows the results from each season's scavenger removal trials conducted at the Gunn's Hill WF. Details on the date placed, species, distance and direction from turbine, visibility class, dates checked and by whom, UTM coordinates, and whether the carcass was scavenged have been provided in Appendix II.

**Table 2. Number of Carcasses Remaining During Scavenger Removal Trials at the Gunn's Hill WF (2017)**

Number of Carcasses Remaining					
Spring Trial (May/June)					
Turbine	Visit 0	Visit 1	Visit 2	Visit 3	Visit 4
T01	1	1	1	0	0
T03	1	1	0	0	0
T04	2	2	2	2	2
T06	2	2	2	2	1
T07	2	1	1	1	1
T08	2	2	1	0	0
T09	2	2	2	2	2
T10	2	2	2	2	2
<b>Total</b>	<b>14</b>	<b>13</b>	<b>11</b>	<b>9</b>	<b>8</b>
Summer Trial (July/August)					
Turbine	Visit 0	Visit 1	Visit 2	Visit 3	Visit 4
T01	2	2	1	1	0
T02	2	1	1	1	1
T03	2	1	1	0	0
T04	1	1	0	0	0
T05	2	2	1	1	1
T06	1	0	0	0	0
T07	1	1	0	0	0
T08	1	0	0	0	0
T09	2	1	1	1	1
T10	1	1	1	0	0
<b>Total</b>	<b>15</b>	<b>10</b>	<b>6</b>	<b>4</b>	<b>3</b>
Fall Trial (September/October)					
Turbine	Visit 0	Visit 1	Visit 2	Visit 3	Visit 4
T01	1	1	1	1	1
T02	1	0	0	0	0
T04	2	2	2	2	1
T05	1	1	1	1	0

Number of Carcasses Remaining					
T06	1	0	0	0	0
T07	1	0	0	0	0
T08	1	1	0	0	0
T09	1	1	1	1	1
T10	1	1	1	1	1
<b>Total</b>	<b>10</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>4</b>

To address the scavenger removal rates for each of the specific monitoring periods, NRSI has used the equation recommended by the MNRF:

$$Sc = \frac{n_{visit1} + n_{visit2} + n_{visit3...}}{n_{visit0} + n_{visit1} + n_{visit2...}}$$

Sc: proportion of carcasses not removed by scavengers

$n_{visit0}$ : total number of carcasses placed

$n_{visit1} - n_{visit3...}$ : numbers of carcasses remaining on visits 1 through 3 etc.

Using the scavenger removal results seen in Table 2 and the equation provided by the MNRF, the seasonal scavenger removal rates have been determined as follows:

$$\begin{aligned} SC_{Spring} &= (13 + 11 + 9 + 8) / (14 + 13 + 11 + 9) \\ &= 41 / 47 \\ &= \mathbf{0.87} \end{aligned}$$

$$\begin{aligned} SC_{Summer} &= (10 + 6 + 4 + 3) / (15 + 10 + 6 + 4) \\ &= 23 / 35 \\ &= \mathbf{0.66} \end{aligned}$$

$$\begin{aligned} SC_{Fall} &= (7 + 6 + 6 + 4) / (10 + 7 + 6 + 6) \\ &= 23 / 29 \\ &= \mathbf{0.79} \end{aligned}$$

The above scavenger removal rates represent the proportion of carcasses still remaining from one visit to the next. These scavenger values generally represent low to moderate scavenging activity throughout the year. The above scavenger removal rates will be used to calculate the estimated avian and bat mortality rates in Sections 6.0 and 8.0.

#### 4.0 Searcher Efficiency Trial Results

Searcher efficiency rates at the Gunn's Hill WF were high throughout the 2017 monitoring season. Results of the monthly searcher efficiency trials are summarized in Table 3 below. Details on the searcher, species, distance and direction from turbine, habitat, substrate, visibility class, UTM coordinates, and whether the carcass was found or scavenged have been provided in Appendix III.

**Table 3. Results of Searcher Efficiency Trials at the Gunn's Hill WF (2017)**

Searcher	Carcasses Found	Carcasses Placed	Carcasses Scavenged	Searcher Efficiency (Se)	Proportion of Turbines Searched
<b>May 2017</b>					
Search Team A	9	10	0	0.90	0.78
Searcher A <sup>1</sup>	N/A	N/A	N/A	0.90	0.11
Search Team B <sup>1</sup>	N/A	N/A	N/A	0.90	0.11
<b>June 2017</b>					
Search Team A	9	10	0	0.90	0.89
Search Team B <sup>1</sup>	N/A	N/A	N/A	0.90	0.11
<b>July 2017</b>					
Search Team A	9	11	1	0.90	1.00
<b>August 2017</b>					
Search Team A	10	11	0	0.91	0.89
Search Team C <sup>1</sup>	N/A	N/A	N/A	0.91	0.11
<b>September 2017</b>					
Search Team A	9	11	1	0.90	1.00
<b>October 2017</b>					
Search Team A	8	10	0	0.80	1.00

<sup>1</sup>This searcher/search team searched on no more than 1 day in the identified month and therefore could not be properly tested for searcher efficiency following MNRF guidelines (i.e. 4 search days are required for proper testing in 1 visibility class as no more than 3 carcasses can be placed at a time). In these circumstances, the average result obtained by the regular search team in each month was used for these searchers/search teams.

Based on the information collected during detailed searcher efficiency trials and equations recommended by the MNRF, searcher efficiency (SeO) was calculated for each of the monitoring months as follows:

$$Se = \frac{\text{number of test carcasses found}}{\text{number of test carcasses placed} - \text{number of test carcasses scavenged}}$$

$$SeO = Se_A(\text{proportion of turbines searched}) + Se_B(\text{proportion of turbines searched})...$$

$$SeO_{\text{May}} = 0.90 (0.78) + 0.90 (0.11) + 0.90 (0.11) = \mathbf{0.90}$$

$$SeO_{\text{June}} = 0.90 (0.89) + 0.90 (0.11) = \mathbf{0.90}$$

$$\begin{aligned}
\text{SeO}_{\text{July}} &= 0.90 (1.00) = \mathbf{0.90} \\
\text{SeO}_{\text{August}} &= 0.91 (0.89) + 0.91 (0.11) = \mathbf{0.91} \\
\text{SeO}_{\text{September}} &= 0.90 (1.00) = \mathbf{0.90} \\
\text{SeO}_{\text{October}} &= 0.80 (1.00) = \mathbf{0.80}
\end{aligned}$$

These searcher efficiency values represent high searcher efficiency rates, largely due to the steps taken to keep the search areas in low visibility classes (i.e. clear and more easily searched) to increase the accuracy of the estimated mortality rate. These values will be used to calculate the estimated avian and bat mortality rates in Sections 6.0 and 8.0.

## 5.0 Proportion of Area Searched

Visibility class mapping was completed every month within the 50m search radius of each of the 10 turbines in order to reflect changes in groundcover and resulting visibility classes. All visibility class maps have been provided in Appendix VII.

Visibility class mapping was used in combination with GIS software to determine the proportion of area in visibility class 1 at each turbine. During the 2017 monitoring program, NRSI biologist searched all areas of visibility class 1, which is reflected in the proportion of area searched ( $P_s$ ) calculated for all 10 turbines during each monitoring month, as shown in Table 4. The  $P_s$  values will be used to calculate the estimated avian and bat mortality rates in Sections 6.0 and 8.0.

**Table 4. Proportion of Area Searched at the Gunn's Hill WF (2017)**

Month	Visibility Class(es) Searched	Total Searched Area (m <sup>2</sup> )	Total Search Radius (m <sup>2</sup> )	Proportion of Area Searched ( $P_s$ )
May	1	78,025	78,500	0.99
June	1	78,025	78,500	0.99
July	1	77,891	78,500	0.99
August	1	78,025	78,500	0.99
September	1	78,025	78,500	0.99
October	1	78,025	78,500	0.99



## 6.0 Avian Mortality Results

### 6.1 Avian Mortalities

During the 2017 mortality monitoring period at the Gunn's Hill WF, searchers found 7 bird mortalities within the 50m search radius of the turbines. The majority of the mortalities that could be identified to the species level were confirmed to be small landbirds, generally representing a variety of common species for this area of the province. The most commonly observed mortalities were of golden-crowned kinglet (*Regulus satrapa*) (n=3). One bird mortality could not be identified to the species level due to scavenging activity, but was identified as a passerine species.

A complete list of all avian mortalities observed during the mortality searches has been provided in Appendix IV.

### 6.2 Temporal Distribution of Avian Mortalities

Bird mortalities were primarily observed during the spring (May) and fall (October) migration periods. Mortality was highest in the month of October (n=4) and consisted entirely of kinglet species (*Regulus* spp.). The maximum number of avian mortalities that occurred during a single monitoring event was 2. The distribution of avian mortalities by month is shown in Figure 1 below.

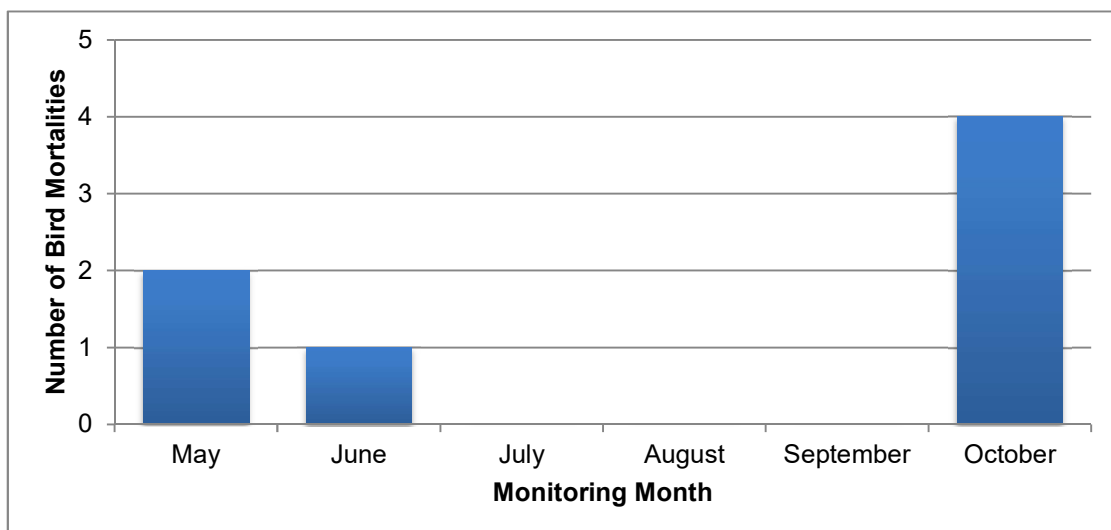
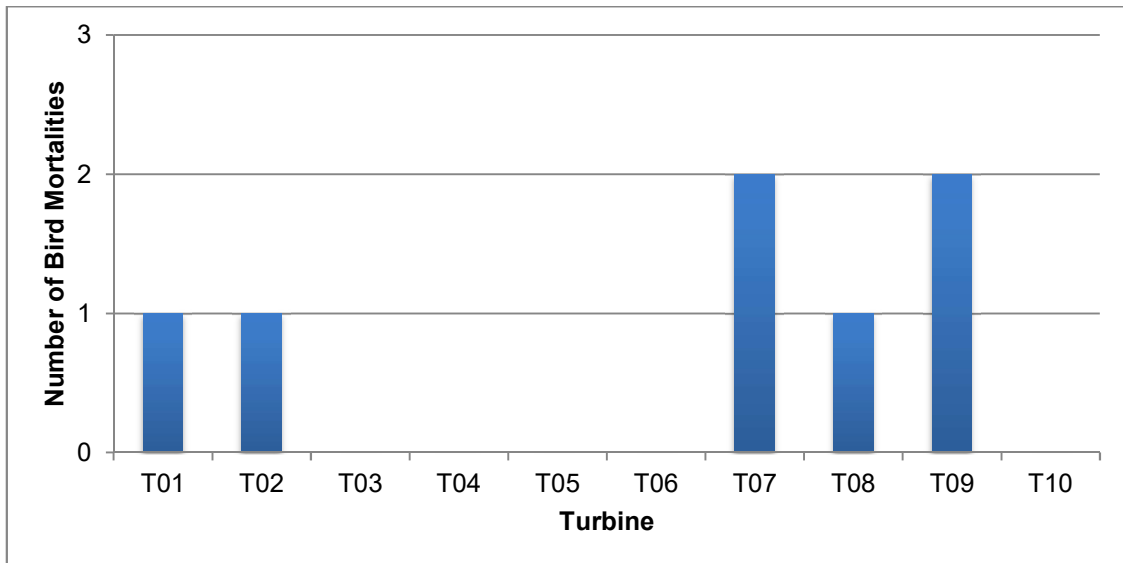


Figure 1. Bird Mortalities Observed by Month at the Gunn's Hill WF (2017)

### 6.3 Spatial Distribution of Avian Mortalities

Avian mortalities were observed at 5 of the 10 turbines (see Figure 2 below). The highest number of mortalities observed at a single turbine was 2, which occurred at each of turbines T07 and T09. Turbine maps identifying the location of each observed mortality have been provided in Appendix VI.



**Figure 2. Bird Mortalities Observed by Turbine at the Gunn's Hill WF (2017)**

### 6.4 Corrected (Estimated) Avian Mortality

In accordance with the *Bird and Bird Habitats: Guidelines for Wind Power Projects* (OMNR 2011b), estimated avian mortality rates have been presented by individual turbines or turbine group. Given the small size of the Gunn's Hill WF (10 turbines), the entire facility has been considered a single turbine group for the purpose of establishing estimated mortality rates.

Based on the field observations at the Gunn's Hill WF, NRSI biologists have compiled the searcher efficiency trial results, scavenger removal trial results, proportion of area searched, and direct mortality observations into an equation that will be used to estimate the total avian mortality at the Gunn's Hill WF in 2017. The equation recommended by the MNRF is found below:

$$C = c / (Se * Sc * P_s)$$

C: Corrected (Estimated) Mortality Rate  
 c: actual observed mortalities  
 Se: overall searcher efficiency  
 Sc: proportion of remaining carcasses  
 P<sub>s</sub>: proportion of area searched

Using the equation and variables described above, the estimated avian mortality rates by month have been presented below:

$$C_{\text{May}} = 2 / (0.90 * 0.87 * 0.99) = 2 / 0.7752 = \mathbf{2.58 \text{ birds}} \\ = \mathbf{0.26 \text{ birds/turbine}} \text{ (0.14 birds/MW)}$$

$$C_{\text{June}} = 1 / (0.90 * 0.87 * 0.99) = 1 / 0.7752 = \mathbf{1.29 \text{ birds}} \\ = \mathbf{0.13 \text{ birds/turbine}} \text{ (0.07 birds/MW)}$$

$$C_{\text{July}} = 0 / (0.90 * 0.66 * 0.99) = 0 / 0.5881 = \mathbf{0.00 \text{ birds}} \\ = \mathbf{0.00 \text{ birds/turbine}} \text{ (0.00 birds/MW)}$$

$$C_{\text{August}} = 0 / (0.91 * 0.66 * 0.99) = 0 / 0.5946 = \mathbf{0.00 \text{ birds}} \\ = \mathbf{0.00 \text{ birds/turbine}} \text{ (0.00 birds/MW)}$$

$$C_{\text{September}} = 0 / (0.90 * 0.79 * 0.99) = 0 / 0.7039 = \mathbf{0.00 \text{ birds}} \\ = \mathbf{0.00 \text{ birds/turbine}} \text{ (0.00 birds/MW)}$$

$$C_{\text{October}} = 4 / (0.80 * 0.79 * 0.99) = 4 / 0.6257 = \mathbf{6.39 \text{ birds}} \\ = \mathbf{0.64 \text{ birds/turbine}} \text{ (0.36 birds/MW)}$$

## 6.5 Summary

A total of 7 avian mortalities were documented at the Gunn's Hill WF in 2017. Avian mortalities were found at 5 out of 10 turbines, ranging from 0 to 2 mortalities per turbine. Mortalities were primarily observed during the spring (May) and fall (October) migration periods.

Using the appropriate variables and equations recommended by the MNRF, the corrected (estimated) avian mortality at the Gunn's Hill WF in 2017 was calculated. Table 5 shows the monthly estimated mortality rates as well as the overall estimated avian mortality rate at the Gunn's Hill WF, as calculated by turbine group.

**Table 5. Corrected Bird Mortality Rates Based on Mortality Monitoring at the Gunn's Hill WF (2017)**

Month (2017)	Observed Avian Mortalities	Corrected Mortality (birds/turbine group)	Corrected Mortality (birds/MW)
May	2	0.26	0.14
June	1	0.13	0.07
July	0	0.00	0.00
August	0	0.00	0.00
September	0	0.00	0.00
October	4	0.64	0.36
<b>TOTAL</b>	<b>7</b>	<b>1.03</b>	<b>0.57</b>

Based on the information collected during the 2017 post-construction monitoring period, the anticipated impact of this facility on birds is characterized by an estimated mortality rate of **1.03 birds/turbine/year** (0.57 birds/MW/year), as calculated by turbine group.

## 7.0 Raptor Mortality Results

### 7.1 Raptor Mortalities

Mortality searches for raptors were conducted twice-weekly from May to October in conjunction with avian and bat mortality searches and once-weekly in November at each of the 10 turbines. These searches resulted in the documentation of 1 raptor mortality at the Gunn's Hill WF, a red-tailed hawk (*Buteo jamaicensis*), which was observed in June at turbine T04. Red-tailed hawk is not a tracked raptor species in Ontario (MNR 2017a).

Further details regarding the single raptor mortality are provided in Appendix IV, and turbine maps identifying the location of this mortality are provided in Appendix VI.

### 7.2 Corrected (Estimated) Raptor Mortality

Using assumed searcher efficiency and scavenger removal values of 1.00, and the proportion of area searched for the month of June (when the observation occurred), the estimated raptor mortality rate is as follows:

$$C_{\text{June}} = 1 / (1.00 * 1.00 * 0.99) = 1 / 0.99 = \mathbf{1.01 \text{ raptors}}$$

Using the appropriate variables, the estimated raptor mortality at the Gunn's Hill WF is a total of 1.01 raptors. This number corresponds to a value of **0.10 raptors/turbine/year** or 0.06 raptors/MW/year.

## 8.0 Bat Mortality Results

### 8.1 Bat Mortalities

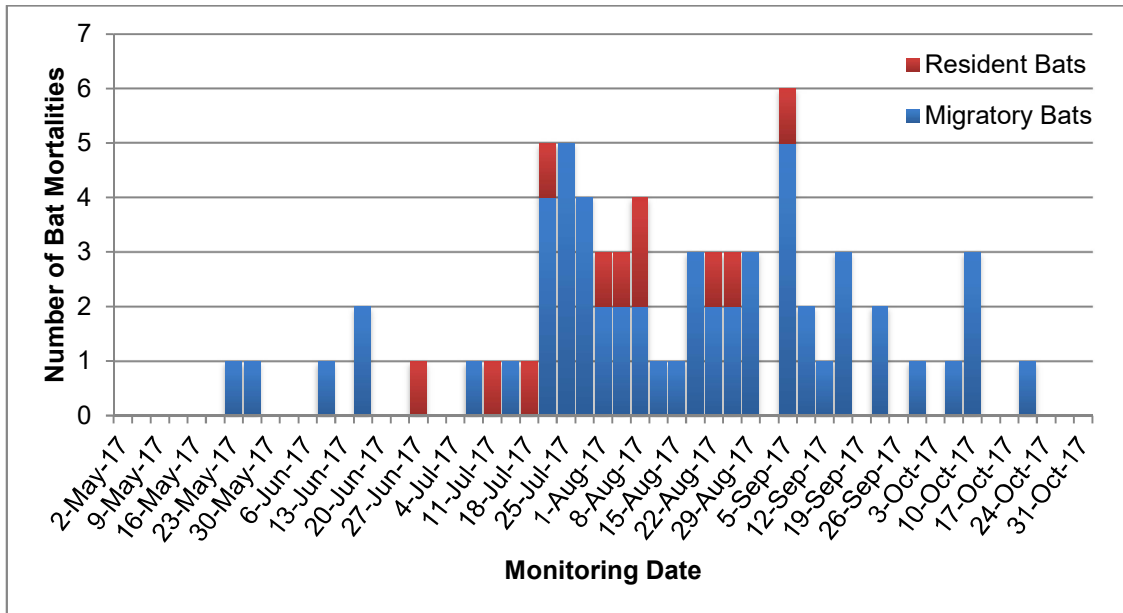
During the 2017 post-construction mortality monitoring period at the Gunn's Hill WF, searchers observed 68 bat mortalities within the 50m search radius of the turbines. Bat mortalities represented 4 different species, including 3 long-distance migratory species (hoary bat, eastern red bat, and silver-haired bat), as well as the resident species big brown bat (*Eptesicus fuscus*). The most abundant species observed was hoary bat (n=32), followed by silver-haired bat (n=20), big brown bat (n=11), and eastern red bat (n=5). Observed mortalities of the 3 long-distance migratory bat species combine to represent 84% of all documented mortalities.

In addition, 1 live hoary bat was encountered while completing mortality monitoring. This bat showed no visible signs of injury and appeared to behave normally. As a result, the bat was moved outside of the 50m search radius and placed on a nearby tree. Given that there was no indication of injury, this bat is assumed to have recovered, and as a result, it has not been included in the calculation of estimated mortality rates below.

A detailed examination of bat mortalities at the Gunn's Hill WF has been included in the following sections. Detailed information regarding each bat mortality observed during mortality searches has been provided in Appendix V.

### 8.2 Temporal Distribution of Bat Mortalities

Bat mortalities were observed between mid-May and mid-October, but were most abundantly observed during the months of July through September (84% of all bat mortalities; Figure 3). The monitoring day with the highest number of mortalities observed was September 1 (n=6).

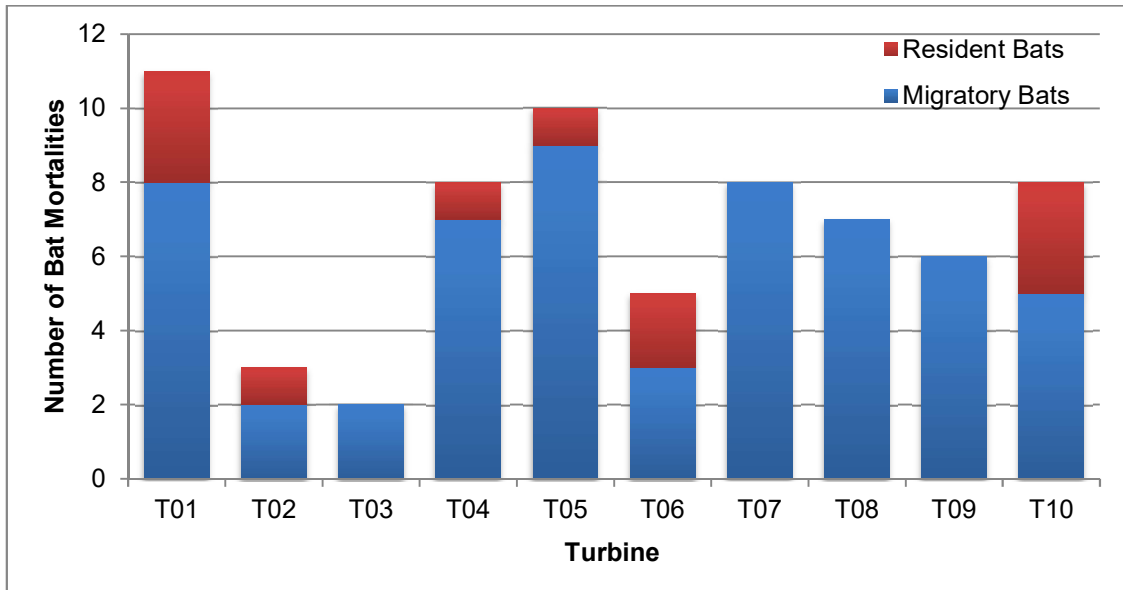


**Figure 3. Bat Mortalities Observed by Date at the Gunn's Hill WF (2017)**

Patterns of bat mortalities appear to be consistent with the expected migratory time periods for these species, with increases in bat mortalities during the mid-summer to early fall. Overall, bat mortality was concentrated during the months of July through September, corresponding to the anticipated peak periods of summer swarming and fall migration of bats.

### 8.3 Spatial Distribution of Bat Mortalities

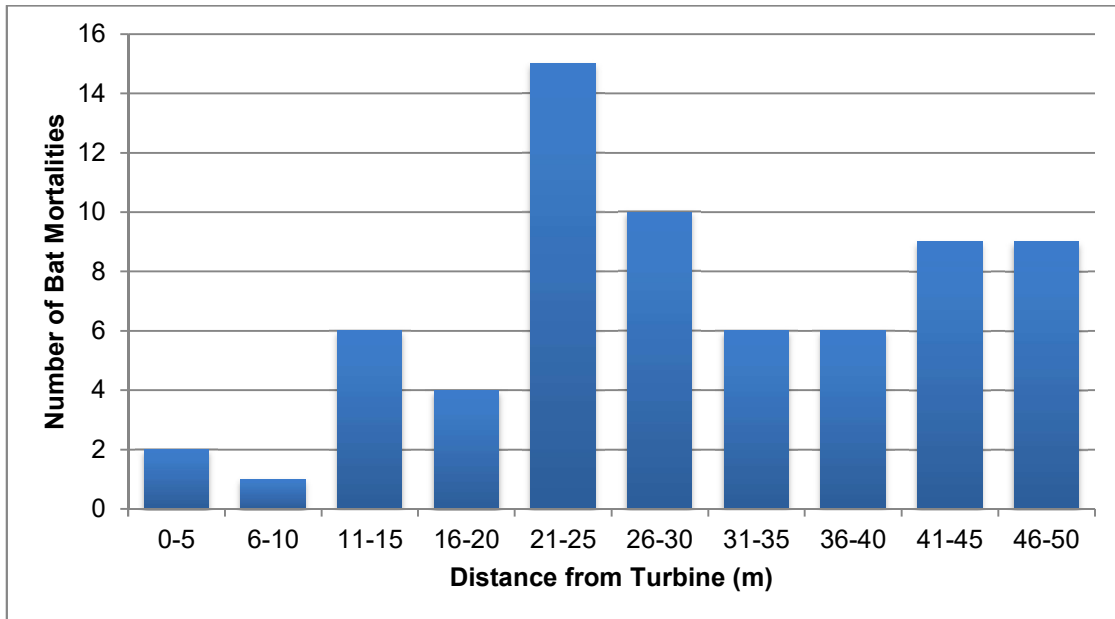
Bat mortalities were observed at all 10 turbines at the Gunn's Hill WF in 2017 (see Figure 4 below). The number of mortalities observed at each turbine varied, ranging from 2 mortalities at turbine T03 to 11 mortalities at turbine T01 (Figure 4).



**Figure 4. Bat Mortalities Observed by Turbine at the Gunn's Hill WF (2017)**

Distance and direction of bat mortalities from each of the turbine bases were also documented for each observed mortality. Bat mortalities were found throughout the search areas, ranging in distance from <1m to 49m from the turbine base, and averaging a distance of approximately 30m from the turbine base. The overall distribution of mortalities by distance class can be seen in Figure 5 below. Maps identifying the location of each observed mortality by turbine are provided in Appendix VI.





**Figure 5. Bat Mortalities Observed by Distance from Turbine at the Gunn's Hill WF (2017)**

#### 8.4 Corrected (Estimated) Bat Mortality

Based on the field observations at the Gunn's Hill WF, NRSI biologists have compiled the searcher efficiency trials, scavenger removal trials, proportion of area searched, and direct mortality values in an equation that will be used to estimate the total bat mortality at the Gunn's Hill WF in 2017. The equation recommended by the MNRF is found below:

$$C = c / (Se * Sc * Ps)$$

C: Corrected (Estimated) Mortality Rate  
 c: actual observed mortalities  
 Se: overall searcher efficiency  
 Sc: proportion of remaining carcasses  
 Ps: proportion of area searched

Using the equation and variables described above, the estimated bat mortality rates (by month) have been presented below:

$$C_{\text{May}} = 2 / (0.90 * 0.87 * 0.99) = 2 / 0.7752 = \mathbf{2.58 \text{ bats}}$$

$$= \mathbf{0.26 \text{ bats/turbine}} \text{ (0.14 bats/MW)}$$

$$C_{\text{June}} = 4 / (0.90 * 0.87 * 0.99) = 4 / 0.7752 = \mathbf{5.16 \text{ bats}}$$

$$= \mathbf{0.52 \text{ bats/turbine}} \text{ (0.29 bats/MW)}$$

$$C_{\text{July}} = 21 / (0.90 * 0.66 * 0.99) = 21 / 0.5881 = \mathbf{35.71 \text{ bats}}$$

$$= \mathbf{3.57 \text{ bats/turbine}} \text{ (1.98 bats/MW)}$$

$$C_{\text{August}} = 21 / (0.91 * 0.66 * 0.99) = 21 / 0.5946 = \mathbf{35.32 \text{ bats}}$$

$$= \mathbf{3.53 \text{ bats/turbine}} \text{ (1.96 bats/MW)}$$

$$C_{\text{September}} = 15 / (0.90 * 0.79 * 0.99) = 15 / 0.7039 = \mathbf{21.31 \text{ bats}}$$

$$= \mathbf{2.13 \text{ bats/turbine}} \text{ (1.18 bats/MW)}$$

$$C_{\text{October}} = 5 / (0.80 * 0.79 * 0.99) = 5 / 0.6257 = \mathbf{7.99 \text{ bats}}$$

$$= \mathbf{0.80 \text{ bats/turbine}} \text{ (0.44 bats/MW)}$$

## 8.5 Summary

A total of 68 bat mortalities were documented at the Gunn's Hill WF in 2017. Mortalities included all 3 of Ontario's long-distance migratory bat species, including hoary bat, silver-haired bat, and eastern red bat, which combined to represent 84% of the total bat mortalities observed. Big brown bat, a resident species known to over-winter in Ontario, was also observed. Bat mortalities were most abundant during the months of July through September, when 84% of all bat mortalities occurred. Bat mortalities ranged from 2 to 11 mortalities at each turbine.

Using the appropriate variables and recommended equations provided by the MNRF, NRSI has determined the corrected (estimated) bat mortality at the Gunn's Hill WF in 2017. Each of the corrected monthly bat mortality rates and the corrected annual bat mortality rate for the Gunn's Hill WF are provided in Table 6.

**Table 6. Corrected Bat Mortality Rates Based on Mortality Monitoring at the Gunn's Hill WF (2017)**

Month (2017)	Observed Bat Mortalities	Corrected Mortality (bats/turbine)	Corrected Mortality (bats/MW)
May	2	0.26	0.14
June	4	0.52	0.29
July	21	3.57	1.98
August	21	3.53	1.96
September	15	2.13	1.18
October	5	0.80	0.44
<b>TOTAL</b>	<b>68</b>	<b>10.81</b>	<b>5.99</b>

Based on the information collected during the 2017 post-construction monitoring period, the anticipated impact of this facility on bats is characterized by a corrected mortality rate of **10.81 bats/turbine/year** (5.99 bats/MW/year).

## **9.0 Mortality Thresholds and Notifications**

In accordance with the appropriate MNRF guidelines, project approval conditions, and other commitments made as part of the monitoring program, several mortality thresholds and notification requirements for the Gunn's Hill WF have been established. The status of each threshold and confirmation of notifications, where applicable, have been described in the following sections.

### **9.1 Annual Bird Mortality**

The annual bird mortality threshold for the Gunn's Hill WF is 14 birds/turbine/year, calculated by individual turbine or turbine group. Based on an estimated rate of 1.03 birds/turbine/year, as calculated by turbine group, the Gunn's Hill WF remains below this threshold. Since the results are below the established threshold, no notification is required.

### **9.2 Annual Raptor Mortality**

The annual raptor mortality threshold for the Gunn's Hill WF is 0.2 raptors/turbine/year (or 0.1 raptors/turbine/year for provincially tracked raptors). Based on an estimated rate of 0.10 raptors/turbine/year and no mortalities of provincially tracked raptors, the Gunn's Hill WF remains below these thresholds. Since the results are below the established thresholds, no notification is required.

### **9.3 Annual Bat Mortality**

The annual bat mortality threshold for the Gunn's Hill WF is 10 bats/turbine/year. Based on an estimated rate of 10.81 bats/turbine/year, the Gunn's Hill WF has exceeded this threshold. The submission of this report to the MNRF will satisfy the requirement to notify the MNRF within 3 months of the completion of the annual mortality monitoring activities.

### **9.4 Significant Bird Mortality Event**

Significant bird mortality events have been defined by the MNRF as single-day mortality events with 10 or more birds at any one turbine or 33 or more birds (including raptors) at multiple turbines. Neither of these single-day mortality events was observed at the

Gunn's Hill WF during the 2017 monitoring year. As no significant bird mortality event occurred, no notification is required.

#### 9.5 Species at Risk Mortality Event

Any Species at Risk (SAR; MNRF 2017b) mortality documented during post-construction mortality monitoring at the Gunn's Hill WF requires formal notification to the MNRF within 24 hours (or next business day) of a confirmed species identification (Prowind Canada Inc. 2013). In accordance with the *Post-Construction Environmental Effects Monitoring Plan: Birds and Bats* (Prowind Canada Inc. 2013), notification was sent to the MNRF within 24 hours following confirmed identification of a SAR mortality at the Gunn's Hill WF, as applicable.

## 10.0 Summary and Conclusions

NRSI was retained to conduct post-construction monitoring at the operational Gunn's Hill WF. The Gunn's Hill WF consists of 10 operational wind energy generating turbines with a total nameplate capacity of 18MW.

Post-construction monitoring at the Gunn's Hill WF in 2017 included bird, bat, and raptor mortality monitoring, searcher efficiency trials, scavenger removal trials, and visibility class mapping. These surveys were conducted to assess the potential impacts of this wind energy generating facility on local and migratory birds and bats.

A total of 7 avian mortalities were documented at the Gunn's Hill WF during the 2017 monitoring period. Given the number of observed avian mortalities, searcher efficiency rates, scavenger removal rates, proportion of area searched, and equations recommended by the MNRF, a total corrected (estimated) avian mortality rate of **1.03 birds/turbine/year** (0.57 birds/MW/year), as calculated by turbine group, has been determined for the Gunn's Hill WF. This estimated mortality rate is below the threshold level of 14 birds/turbine/year established by the MNRF guidelines. No significant bird mortality events of 10 or more birds at any one turbine or 33 or more birds (including raptors) at multiple turbines on a single survey date were observed.

A single raptor mortality was documented at the Gunn's Hill WF during the 2017 monitoring period. Based on the observed raptor mortality, a corrected (estimated) raptor mortality rate of **0.10 raptors/turbine/year** (0.06 raptors/MW/year) has been determined for the Gunn's Hill WF. This raptor mortality rate is below the provincial threshold level of 0.20 raptors/turbine/year established by the MNRF guidelines.

A total of 68 bat mortalities were documented during the 2017 mortality monitoring period at the Gunn's Hill WF. Long-distance migratory bat species were the most commonly observed mortalities at the project. Based on the number of observed bat mortalities, searcher efficiency rates, scavenger removal rates, proportion of area searched, and equations recommended by the MNRF, a total corrected (estimated) bat mortality rate of **10.81 bats/turbine/year** (5.99 bats/MW/year) has been determined for

the Gunn's Hill WF. The estimated bat mortality rate exceeds the provincial threshold level of 10 bats/turbine/year established by the MNRF guidelines.

## 11.0 References

- Ministry of Natural Resources and Forestry (MNR). 2017a. Species Lists: Birds. Natural Heritage Information Centre (NHIC). Queen's Printer for Ontario. Available at: <https://www.ontario.ca/page/get-natural-heritage-information>
- Ministry of Natural Resources and Forestry (MNR). 2017b. Species at Risk in Ontario (SARO) List. Available at: <http://www.ontario.ca/environment-and-energy/species-risk-ontario-list>
- Ontario Ministry of Natural Resources (OMNR). 2011a. Bats and Bat Habitats: Guidelines for Wind Power Projects. First edition. July 2011.
- Ontario Ministry of Natural Resources (OMNR). 2011b. Bird and Bird Habitats: Guidelines for Wind Power Projects. First Edition. December 2011.
- Prowind Canada Inc. 2013. Gunn's Hill Wind Farm - Post-construction Environmental Effects Monitoring Plan: Birds and Bats. June 2013.












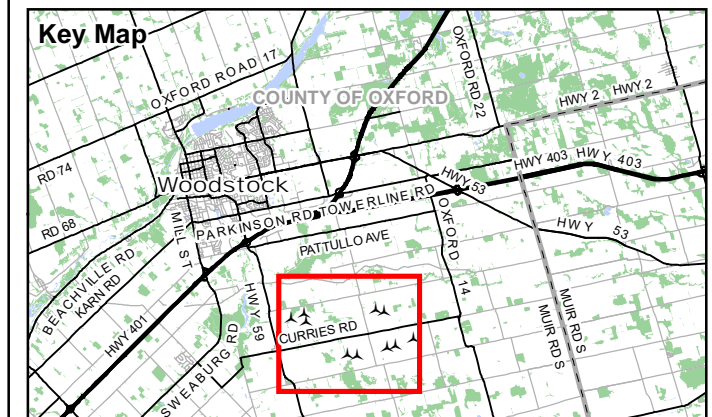
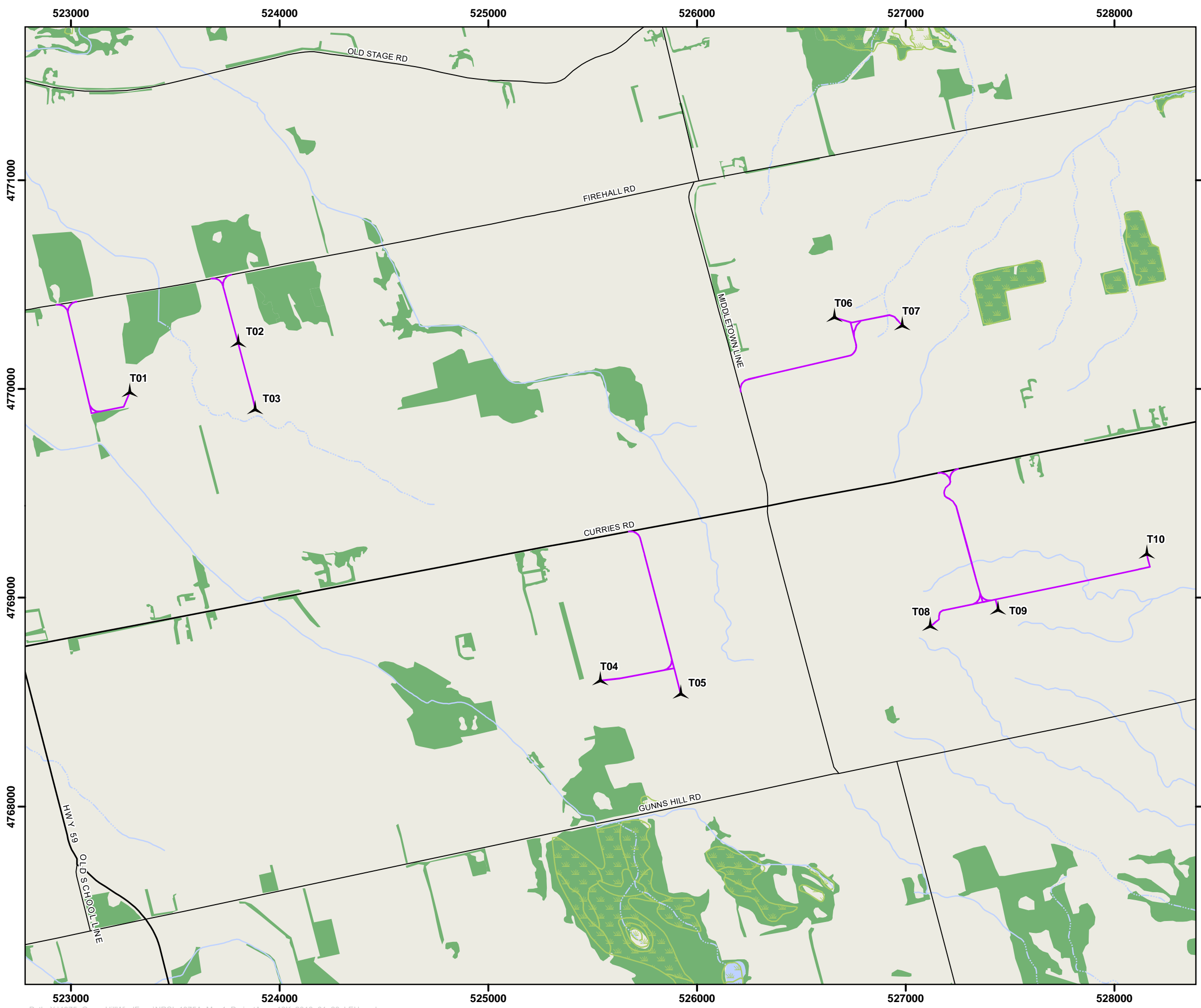
**Maps**

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# Gunn's Hill Wind Farm Project Area

### Legend

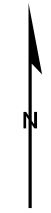
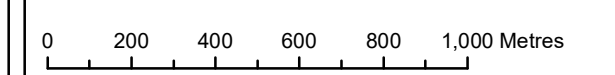
-  Turbine
-  Access Road
-  Primary Road
-  Secondary Road
-  Permanent Watercourse
-  Intermittent Watercourse
-  Water Body
-  Wetland
-  Wooded Area



**NATURAL RESOURCE SOLUTIONS INC.**  
 Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRFO. Copyright: Queen's Printer Ontario.

Project: 1875A Date: January 29, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:18,000
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**Appendix I**  
Post-construction Monitoring Data Sheets

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# Searcher Efficiency Data Form

Project Name: \_\_\_\_\_ Project #: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ hrs

Searcher: \_\_\_\_\_ Placed By: \_\_\_\_\_

Condition of Carcasses: Fresh Thawed Carcasses marked (and how)? \_\_\_\_\_

## WEATHER

Temp: \_\_\_\_\_ °C \*Wind Speed: \_\_\_\_\_ Wind Direction (from): \_\_\_\_\_ Visibility: High Medium Low

Cloud Cover (%): \_\_\_\_\_ Cloud Height: High Medium Low Precipitation: Rain Fog Snow None \_\_\_\_\_

Additional Weather or Other Comments: \_\_\_\_\_

	Time Placed (24hr)	Turbine #	Species	Distance From Turbine	Direction from Turbine	Habitat/Substrate	Visibility Class	UTM	Found By Searcher (Y/N)	Found After Search (Y/N)
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

\*Beaufort Wind Scale: 0 calm; 1 smoke drifts; 2 wind felt on face; 3 leaves in motion; 4 small branches move; 5 small trees sway; 6 large branches move; 7 whole trees in motion; 8 twigs break off and hard to walk; 9 light structural damage; 10 tree uprooted

## Placement Location Sketches (Draw access road for each sketch)

N ↑

1	2	3	4	5	6	7	8	9	10
X	X	X	X	X	X	X	X	X	X
T#___	T#___	T#___	T#___	T#___	T#___	T#___	T#___	T#___	T#___

# Visibility Class Map

Project Name: \_\_\_\_\_ Project #: \_\_\_\_\_ Turbine #: \_\_\_\_\_ Degree of Slope \_\_\_\_\_ degrees Slope Orientation \_\_\_\_\_ (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: \_\_\_\_\_  
 Facing East: \_\_\_\_\_  
 Facing South: \_\_\_\_\_  
 Facing West: \_\_\_\_\_  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): \_\_\_/\_\_\_/\_\_\_ ↑  
 Observer: \_\_\_\_\_  
 Monthly/Seasonal  
 Linear Transect Width: \_\_\_\_\_ m

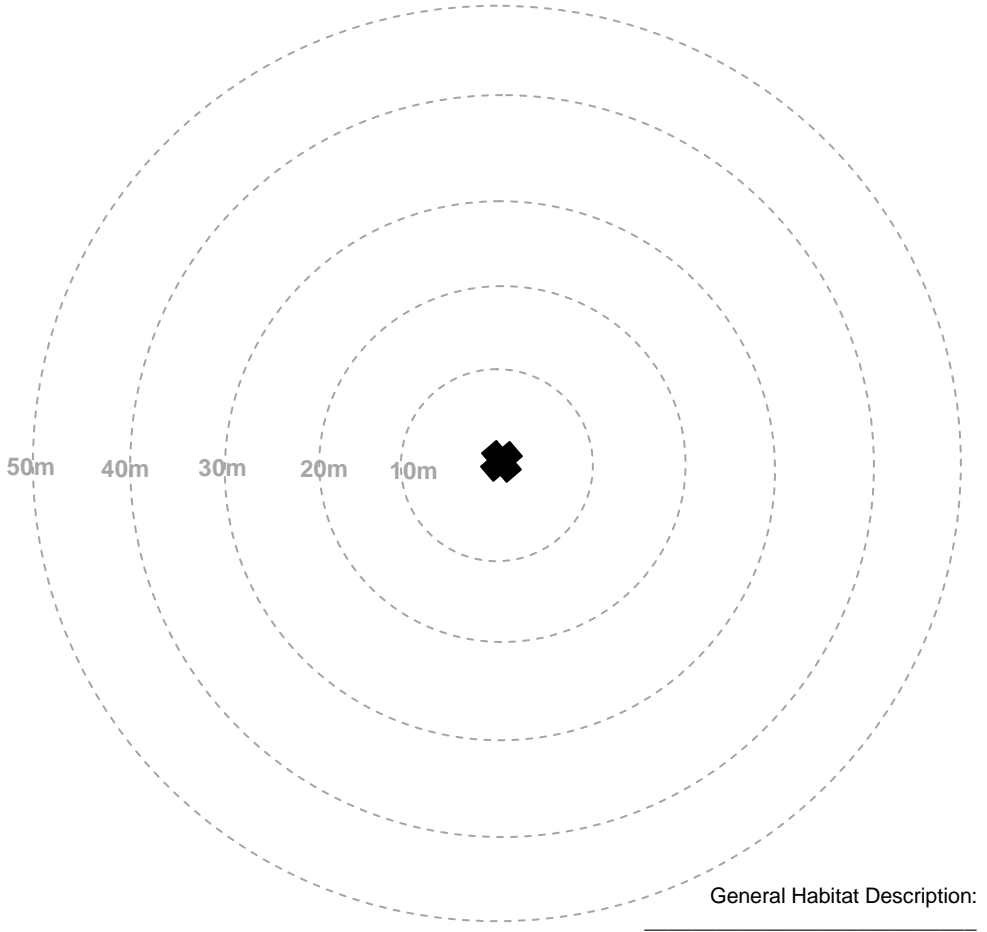
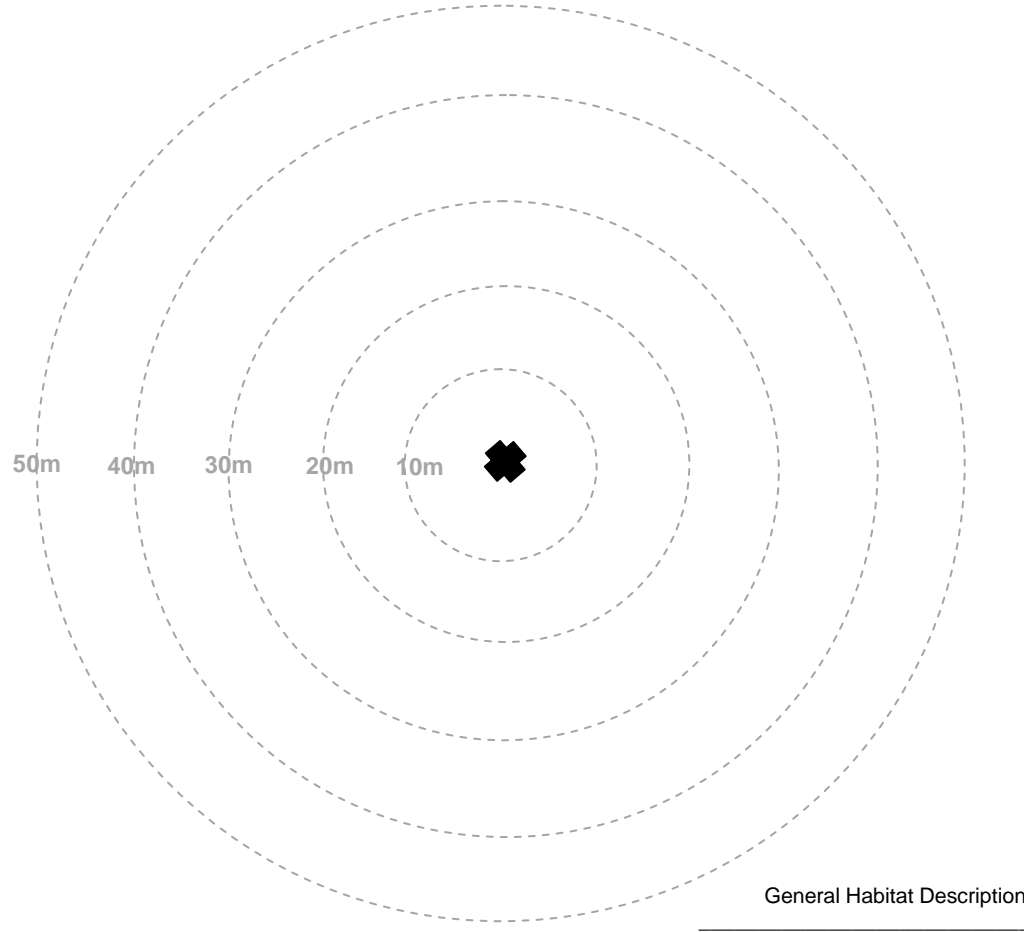


Photo Numbers (from turbine base)  
 Facing North: \_\_\_\_\_  
 Facing East: \_\_\_\_\_  
 Facing South: \_\_\_\_\_  
 Facing West: \_\_\_\_\_  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): \_\_\_/\_\_\_/\_\_\_ ↑  
 Observer: \_\_\_\_\_  
 Monthly/Seasonal  
 Linear Transect Width: \_\_\_\_\_ m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

**Appendix II**  
Scavenger Removal Trial Results

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Appendix II  
 1875A Gunn's Hill Wind Farm  
 Scavenger Removal Trial Results 2017

Spring (May/June) 2017 Scavenger Removal Trial

Carcass Number	Turbine	Species	Distance from Turbine Base (m)	Direction from Turbine Base (°)	UTM	Visibility Class	Test Day	Date	Carcass Present	Signs of Scavenging	Tester
1	T04	Golden-crowned Kinglet	37	355	17T 525547 4768628	1	Day 0	05-May-17	Y	Carcass placed	Search Team A
							Day 4	09-May-17	Y	Coyote tracks ~15m away	Search Team A
							Day 7	12-May-17	Y	None	Search Team B
							Day 11	16-May-17	Y	None	Search Team A
							Day 14	19-May-17	Y	None	Search Team A
2	T06	Silver-haired Bat	35	220	17T 526635 4770313	1	Day 0	05-May-17	Y	Carcass placed	Search Team A
							Day 4	09-May-17	Y	None	Search Team A
							Day 7	12-May-17	Y	None	Search Team B
							Day 11	16-May-17	Y	None	Search Team A
							Day 14	19-May-17	Y	Partially scavenged	Search Team A
3	T07	Silver-haired Bat	7	230	17T 526974 4770298	1	Day 0	05-May-17	Y	Carcass placed	Search Team A
							Day 4	09-May-17	Y	None	Search Team A
							Day 7	12-May-17	Y	None	Search Team B
							Day 11	16-May-17	Y	None	Search Team A
							Day 14	19-May-17	Y	None	Search Team A
4	T08	Fox Sparrow	41	30	17T 527134 4768906	1	Day 0	05-May-17	Y	Carcass placed	Search Team A
							Day 4	09-May-17	Y	None	Search Team A
							Day 7	12-May-17	Y	None	Search Team B
							Day 11	16-May-17	N	Carcass removed	Search Team A
							Day 14	19-May-17	N	N/A	Search Team A
5	T09	Silver-haired Bat	31	310	17T 527439 4768961	1	Day 0	12-May-17	Y	Carcass placed	Search Team B
							Day 4	16-May-17	Y	None	Search Team A
							Day 7	19-May-17	Y	None	Search Team A
							Day 11	23-May-17	Y	None; decomposing	Search Team A
							Day 14	26-May-17	Y	None; decomposing	Search Team A
6	T01	Magnolia Warbler	45	205	17T 523259 4769940	1	Day 0	16-May-17	Y	Carcass placed	Search Team A
							Day 3	19-May-17	Y	None	Search Team A
							Day 7	23-May-17	Y	Carcass moved by plough	Search Team A
							Day 10	26-May-17	N	Carcass removed	Search Team A
							Day 14	30-May-17	N	N/A	Search Team A
7	T03	Ruby-crowned Kinglet	23	35	17T 523880 4769930	1	Day 0	16-May-17	Y	Carcass placed	Search Team A
							Day 3	19-May-17	Y	None; decomposing	Search Team A
							Day 7	23-May-17	N	Carcass removed; only a few feathers remain	Search Team A
							Day 10	26-May-17	N	N/A	Search Team A
							Day 14	30-May-17	N	N/A	Search Team A
8	T09	Eastern Red Bat	8	15	17T 527442 4768948	1	Day 0	16-May-17	Y	Carcass placed	Search Team A
							Day 3	19-May-17	Y	None	Search Team A
							Day 7	23-May-17	Y	None	Search Team A
							Day 10	26-May-17	Y	None	Search Team A
							Day 14	30-May-17	Y	None	Search Team A
9	T10	Golden-crowned Kinglet	38	220	17T 528131 4769173	1	Day 0	16-May-17	Y	Carcass placed	Search Team A
							Day 3	19-May-17	Y	None	Search Team A
							Day 7	23-May-17	Y	None; decomposing	Search Team A
							Day 10	26-May-17	Y	None; decomposing	Search Team A
							Day 14	30-May-17	Y	None; decomposing	Search Team A

Carcass Number	Turbine	Species	Distance from Turbine Base (m)	Direction from Turbine Base (°)	UTM	Visibility Class	Test Day	Date	Carcass Present	Signs of Scavenging	Tester
10	T04	Tree Swallow	30	130	17T 525551 4768659	1	Day 0	02-Jun-17	Y	Carcass placed	Search Team B
							Day 4	06-Jun-17	Y	None	Search Team A
							Day 7	09-Jun-17	Y	None	Search Team A
							Day 11	13-Jun-17	Y	None	Search Team A
							Day 14	16-Jun-17	Y	None	Search Team A
11	T06	Hoary Bat	21	330	17T 526648 4770360	1	Day 0	2-Jun-17	Y	Carcass placed	Search Team B
							Day 4	6-Jun-17	Y	None	Search Team A
							Day 7	9-Jun-17	Y	None	Search Team A
							Day 11	13-Jun-17	Y	None	Search Team A
							Day 14	16-Jun-17	N	Carcass removed; coyote tracks	Search Team A
12	T07	Golden-crowned Kinglet	41	260	17T 526942 4770280	1	Day 0	2-Jun-17	Y	Carcass placed	Search Team B
							Day 4	6-Jun-17	N	Carcass removed; only a few feathers remain	Search Team A
							Day 7	9-Jun-17	N	N/A	Search Team A
							Day 11	13-Jun-17	N	N/A	Search Team A
							Day 14	16-Jun-17	N	N/A	Search Team A
13	T08	Eastern Red Bat	14	350	17T 527110 4768880	1	Day 0	2-Jun-17	Y	Carcass placed	Search Team B
							Day 4	6-Jun-17	Y	None	Search Team A
							Day 7	9-Jun-17	N	Carcass removed	Search Team A
							Day 11	13-Jun-17	N	N/A	Search Team A
							Day 14	16-Jun-17	N	N/A	Search Team A
14	T10	Ruby-crowned Kinglet	40	150	17T 528180 4769169	1	Day 0	2-Jun-17	Y	Carcass placed	Search Team B
							Day 4	6-Jun-17	Y	None	Search Team A
							Day 7	9-Jun-17	Y	None	Search Team A
							Day 11	13-Jun-17	Y	None	Search Team A
							Day 14	16-Jun-17	Y	None	Search Team A

Summer (July/August) 2017 Scavenger Removal Trial

Carcass Number	Turbine	Species	Distance from Turbine Base (m)	Direction from Turbine Base (°)	UTM	Visibility Class	Test Day	Date	Carcass Present	Signs of Scavenging	Tester
1	T01	Golden-crowned Kinglet	34	160	17T 523287 4769947	1	Day 0	04-Jul-17	Y	Carcass placed	Search Team A
							Day 3	07-Jul-17	Y	None	Search Team A
							Day 7	11-Jul-17	N	Carcass removed	Search Team A
							Day 10	14-Jul-17	N	N/A	Search Team A
							Day 14	18-Jul-17	N	N/A	Search Team A
2	T02	Silver-haired Bat	30	155	17T 523806 4770184	1	Day 0	04-Jul-17	Y	Carcass placed	Search Team A
							Day 3	07-Jul-17	Y	None	Search Team A
							Day 7	11-Jul-17	Y	None	Search Team A
							Day 10	14-Jul-17	Y	None	Search Team A
							Day 14	18-Jul-17	Y	None	Search Team A
3	T03	Magnolia Warbler	19	275	17T 523858 4769897	1	Day 0	04-Jul-17	Y	Carcass placed	Search Team A
							Day 3	07-Jul-17	Y	None	Search Team A
							Day 7	11-Jul-17	Y	Many feathers remain	Search Team A
							Day 10	14-Jul-17	N	Carcass removed	Search Team A
							Day 14	18-Jul-17	N	N/A	Search Team A
4	T09	Tree Swallow	11	40	17T 527297 4769046	1	Day 0	04-Jul-17	Y	Carcass placed	Search Team A
							Day 3	07-Jul-17	Y	None	Search Team A
							Day 7	11-Jul-17	Y	None; decomposing	Search Team A
							Day 10	14-Jul-17	Y	None; decomposing	Search Team A
							Day 14	18-Jul-17	Y	None; decomposing	Search Team A
5	T05	Eastern Red Bat	44	240	17T 525884 4768509	1	Day 0	07-Jul-17	Y	Carcass placed	Search Team A
							Day 4	11-Jul-17	Y	None	Search Team A
							Day 7	14-Jul-17	Y	None	Search Team A
							Day 11	18-Jul-17	Y	None; decomposing	Search Team A
							Day 14	21-Jul-17	Y	None; decomposing	Search Team A

Carcass Number	Turbine	Species	Distance from Turbine Base (m)	Direction from Turbine Base (°)	UTM	Visibility Class	Test Day	Date	Carcass Present	Signs of Scavenging	Tester
6	T02	Ruby-crowned Kinglet	29	230	17T 523766 4770196	1	Day 0	01-Aug-17	Y	Carcass placed	Search Team A
							Day 3	04-Aug-17	N	Carcass removed; only a few feathers remain	Search Team A
							Day 7	08-Aug-17	N	N/A	Search Team A
							Day 10	11-Aug-17	N	N/A	Search Team C
							Day 14	15-Aug-17	N	N/A	Search Team A
7	T04	Hoary Bat	48	185	17T 525522 4768554	1	Day 0	01-Aug-17	Y	Carcass placed	Search Team A
							Day 3	04-Aug-17	Y	None	Search Team A
							Day 7	08-Aug-17	N	Carcass removed	Search Team A
							Day 10	11-Aug-17	N	N/A	Search Team C
							Day 14	15-Aug-17	N	N/A	Search Team A
8	T06	Nashville Warbler	24	70	17T 526678 4770346	1	Day 0	01-Aug-17	Y	Carcass placed	Search Team A
							Day 3	04-Aug-17	N	Carcass removed; only one feather remains	Search Team A
							Day 7	08-Aug-17	N	N/A	Search Team A
							Day 10	11-Aug-17	N	N/A	Search Team C
							Day 14	15-Aug-17	N	N/A	Search Team A
9	T08	Silver-haired Bat	32	350	17T 527103 4768903	1	Day 0	01-Aug-17	Y	Carcass placed	Search Team A
							Day 3	04-Aug-17	N	Carcass removed	Search Team A
							Day 7	08-Aug-17	N	N/A	Search Team A
							Day 10	11-Aug-17	N	N/A	Search Team C
							Day 14	15-Aug-17	N	N/A	Search Team A
10	T10	Magnolia Warbler	13	30	17T 528160 4769218	1	Day 0	01-Aug-17	Y	Carcass placed	Search Team A
							Day 3	04-Aug-17	Y	None	Search Team A
							Day 7	08-Aug-17	Y	None	Search Team A
							Day 10	11-Aug-17	N	Carcass removed	Search Team C
							Day 14	15-Aug-17	N	N/A	Search Team A
11	T01	Hoary Bat	35	305	17T 523560 4770009	1	Day 0	15-Aug-17	Y	Carcass placed	Search Team A
							Day 3	18-Aug-17	Y	None	Search Team A
							Day 7	22-Aug-17	Y	None	Search Team A
							Day 10	25-Aug-17	Y	Carcass moved; signs of digging near carcass	Search Team A
							Day 14	29-Aug-17	N	Carcass removed	Search Team A
12	T03	Red-eyed Vireo	36	35	17T 523904 4769928	1	Day 0	15-Aug-17	Y	Carcass placed	Search Team A
							Day 3	18-Aug-17	N	Carcass removed	Search Team A
							Day 7	22-Aug-17	N	N/A	Search Team A
							Day 10	25-Aug-17	N	N/A	Search Team A
							Day 14	29-Aug-17	N	N/A	Search Team A
13	T05	Silver-haired Bat	41	340	17T 525904 4768577	1	Day 0	15-Aug-17	Y	Carcass placed	Search Team A
							Day 3	18-Aug-17	Y	None	Search Team A
							Day 7	22-Aug-17	N	Carcass removed	Search Team A
							Day 10	25-Aug-17	N	N/A	Search Team A
							Day 14	29-Aug-17	N	N/A	Search Team A
14	T07	Hoary Bat	17	210	17T 526975 4770284	1	Day 0	15-Aug-17	Y	Carcass placed	Search Team A
							Day 3	18-Aug-17	Y	None	Search Team A
							Day 7	22-Aug-17	N	Carcass removed	Search Team A
							Day 10	25-Aug-17	N	N/A	Search Team A
							Day 14	29-Aug-17	N	N/A	Search Team A
15	T09	Nashville Warbler	26	235	17T 527423 4768915	1	Day 0	15-Aug-17	Y	Carcass placed	Search Team A
							Day 3	18-Aug-17	N	Carcass removed; small paw prints	Search Team A
							Day 7	22-Aug-17	N	N/A	Search Team A
							Day 10	25-Aug-17	N	N/A	Search Team A
							Day 14	29-Aug-17	N	N/A	Search Team A

Fall (September/October) 2017 Scavenger Removal Trial

Carcass Number	Turbine	Species	Distance from Turbine Base (m)	Direction from Turbine Base (°)	UTM	Visibility Class	Test Day	Date	Carcass Present	Signs of Scavenging	Tester
1	T02	Hoary Bat	48	115	17T 523835 4770189	1	Day 0	01-Sep-17	Y	Carcass placed	Search Team A
							Day 4	05-Sep-17	N	Carcass removed	Search Team A
							Day 7	08-Sep-17	N	N/A	Search Team A
							Day 11	12-Sep-17	N	N/A	Search Team A
							Day 14	15-Sep-17	N	N/A	Search Team A
2	T04	White-throated Sparrow	35	70	17T 525570 4768618	1	Day 0	01-Sep-17	Y	Carcass placed	Search Team A
							Day 4	05-Sep-17	Y	None	Search Team A
							Day 7	08-Sep-17	Y	None	Search Team A
							Day 11	12-Sep-17	Y	None	Search Team A
							Day 14	15-Sep-17	N	Carcass removed; only a few feathers remain; coyote tracks	Search Team A
3	T08	Nashville Warbler	13	250	17T 527100 4768853	1	Day 0	01-Sep-17	Y	Carcass placed	Search Team A
							Day 4	05-Sep-17	Y	None	Search Team A
							Day 7	08-Sep-17	N	Carcass removed; one feather remains	Search Team A
							Day 11	12-Sep-17	N	N/A	Search Team A
							Day 14	15-Sep-17	N	N/A	Search Team A
4	T10	Hoary Bat	23	280	17T 528132 4769199	1	Day 0	01-Sep-17	Y	Carcass placed	Search Team A
							Day 4	05-Sep-17	Y	None	Search Team A
							Day 7	08-Sep-17	Y	None	Search Team A
							Day 11	12-Sep-17	Y	None	Search Team A
							Day 14	15-Sep-17	Y	None	Search Team A
5	T06	Silver-haired Bat	41	115	17T 523878 4769874	1	Day 0	15-Sep-17	Y	Carcass placed	Search Team A
							Day 4	19-Sep-17	N	Carcass removed	Search Team A
							Day 7	22-Sep-17	N	N/A	Search Team A
							Day 11	26-Sep-17	N	N/A	Search Team A
							Day 14	29-Sep-17	N	N/A	Search Team A
6	T01	Hoary Bat	22	310	17T 523260 4769991	1	Day 0	03-Oct-17	Y	Carcass placed	Search Team A
							Day 3	06-Oct-17	Y	None	Search Team A
							Day 7	10-Oct-17	Y	None	Search Team A
							Day 10	13-Oct-17	Y	None	Search Team A
							Day 14	17-Oct-17	Y	None	Search Team A
7	T04	Tree Swallow	13	325	17T 525523 4768613	1	Day 0	03-Oct-17	Y	Carcass placed	Search Team A
							Day 3	06-Oct-17	Y	None	Search Team A
							Day 7	10-Oct-17	Y	None	Search Team A
							Day 10	13-Oct-17	Y	None	Search Team A
							Day 14	17-Oct-17	Y	None	Search Team A
8	T05	Eastern Red Bat	31	50	17T 525942 4768553	1	Day 0	03-Oct-17	Y	Carcass placed	Search Team A
							Day 3	06-Oct-17	Y	None	Search Team A
							Day 7	10-Oct-17	Y	None	Search Team A
							Day 10	13-Oct-17	Y	None	Search Team A
							Day 14	17-Oct-17	N	Carcass removed	Search Team A
9	T07	Dark-eyed Junco	20	160	17T 526984 4770283	1	Day 0	03-Oct-17	Y	Carcass placed	Search Team A
							Day 3	06-Oct-17	N	Carcass removed	Search Team A
							Day 7	10-Oct-17	N	N/A	Search Team A
							Day 10	13-Oct-17	N	N/A	Search Team A
							Day 14	17-Oct-17	N	N/A	Search Team A
10	T09	Silver-haired Bat	45	300	17T 527394 4768955	1	Day 0	03-Oct-17	Y	Carcass placed	Search Team A
							Day 3	06-Oct-17	Y	None	Search Team A
							Day 7	10-Oct-17	Y	None	Search Team A
							Day 10	13-Oct-17	Y	None	Search Team A
							Day 14	17-Oct-17	Y	None	Search Team A

**Appendix III**  
Searcher Efficiency Trial Results

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**Appendix III  
1875A Gunn's Hill Wind Farm  
Searcher Efficiency Trial Results 2017**

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
16-May-17	Search Team A	1	T05	Eastern Red Bat	6	60	Gravel	1	525922	4768539	N	N
		2	T04	Red-eyed Vireo	33	210	Bare soil	1	525498	4768600	Y	-
		3	T06	Hoary Bat	24	350	Bare soil	1	526656	4770367	Y	-
19-May-17	Search Team A	4	T08	Red-eyed Vireo	44	10	Bare soil	1	527134	4768910	Y	-
		5	T09	Magnolia Warbler	19	250	Bare soil	1	527420	4768930	Y	-
23-May-17	Search Team A	6	T02	Pine Warbler	41	110	Bare soil	1	523838	4770220	Y	-
		7	T03	Hoary Bat	27	20	Bare soil	1	523886	4769925	Y	-
		8	T06	Tree Swallow	14	190	Bare soil	1	526649	4770331	Y	-
26-May-17	Search Team A	9	T06	Tree Swallow	28	170	Bare soil	1	526654	4770314	Y	-
		10	T09	Hoary Bat	34	356	Bare soil	1	527412	4768960	Y	-

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
6-Jun-17	Search Team A	1	T06	Hoary Bat	33	60	Bare soil	1	526684	4770360	Y	-
		2	T09	Nashville Warbler	14	20	Bare soil	1	527446	4768954	N	N
		3	T10	Hoary Bat	23	175	Gravel	1	528149	4769181	Y	-
13-Jun-17	Search Team A	4	T04	Eastern Red Bat	23	70	Bare soil	1	525557	4768614	Y	-
		5	T05	Tree Swallow	43	280	Bare soil	1	525874	4768533	Y	-
20-Jun-17	Search Team A	6	T01	Magnolia Warbler	44	210	Bare soil	1	523245	4769950	Y	-
		7	T02	Silver-haired Bat	7	100	Gravel	1	523802	4770217	Y	-
		8	T03	Hermit Thrush	32	10	Bare soil	1	523864	4769932	Y	-
23-Jun-17	Search Team A	9	T07	Magnolia Warbler	26	20	Bare soil	1	526971	4770328	Y	-
		10	T05	Hermit Thrush	11	290	Bare soil	1	525906	4768538	Y	-

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
7-Jul-17	Search Team A	1	T02	Hoary Bat	14	190	Gravel	1	523797	4770214	Y	-
14-Jul-17	Search Team A	2	T03	Magnolia Warbler	18	10	Bare soil	1	523882	4769939	Y	-
		3	T06	Hoary Bat	7	180	Gravel	1	526661	4770326	Y	-
		4	T09	Hoary Bat	35	330	Bare soil	1	527412	4768980	Y	-
18-Jul-17	Search Team A	5	T02	Blue Jay	37	190	Bare soil	1	523798	4770176	Y	-
		6	T10	Hoary Bat	14	150	Bare soil	1	528168	4769197	Y	-
21-Jul-17	Search Team A	7	T08	American Woodcock	26	150	Bare soil	1	527135	4768850	N	Y
		8	T09	Hermit Thrush	5	280	Gravel	1	527430	4768935	Y	-
25-Jul-17	Search Team A	9	T07	Nashville Warbler	46	240	Bare soil	1	526935	4770288	N	N
		10	T08	Nashville Warbler	30	120	Bare soil	1	527137	4768862	Y	-
		11	T10	Purple Martin	16	350	Bare soil	1	528162	4769222	Y	-

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
8-Aug-17	Search Team A	1	T01	Hoary Bat	33	250	Bare soil	1	523253	4769958	Y	-
		2	T07	Red-eyed Vireo	15	130	Bare soil	1	526998	4770279	Y	-
		3	T08	Nashville Warbler	45	180	Bare soil	1	527134	4768825	N	N
15-Aug-17	Search Team A	4	T03	Hoary Bat	31	135	Bare soil	1	523905	4769889	Y	-
		5	T04	Nashville Warbler	15	40	Bare soil	1	525555	4768605	Y	-
18-Aug-17	Search Team A	6	T01	Hoary Bat	29	83	Bare soil	1	523300	4769981	Y	-
		7	T05	Red-eyed Vireo	23	50	Bare soil	1	525925	4768556	Y	-
		8	T07	Nashville Warbler	10	190	Bare soil	1	526986	4770291	Y	-
25-Aug-17	Search Team A	9	T06	White-throated Sparrow	43	280	Bare soil	1	526651	4770299	Y	-
		10	T07	Hoary Bat	29	320	Bare soil	1	526945	4770298	Y	-
		11	T09	Nashville Warbler	11	250	Bare soil	1	527432	4768928	Y	-

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
8-Sep-17	Search Team A	1	T05	White-throated Sparrow	23	290	Bare soil	1	540384	4814825	Y	-
		2	T08	Ruby-crowned Kinglet	46	120	Bare soil	1	527154	4768847	N	Y
		3	T10	Silver-haired Bat	16	330	Bare soil	1	528151	4769226	Y	-
12-Sep-17	Search Team A	4	T04	Silver-haired Bat	46	25	Bare soil	1	525541	4768651	Y	-
		5	T08	White-throated Sparrow	7	210	Gravel	1	527119	4768868	N	N
		6	T10	Purple Martin	35	5	Bare soil	1	528148	4769243	Y	-
15-Sep-17	Search Team A	7	T01	Nashville Warbler	47	100	Bare soil	1	523327	4769970	Y	-
		8	T02	Silver-haired Bat	13	340	Bare soil	1	523787	4770229	Y	-
		9	T03	White-throated Sparrow	25	180	Bare soil	1	523879	4769873	Y	-
19-Sep-17	Search Team A	10	T04	Hoary Bat	21	45	Bare soil	1	525546	4768628	Y	-
		11	T08	Ruby-crowned Kinglet	15	260	Bare soil	1	527096	4768863	Y	-

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
3-Oct-17	Search Team A	1	T06	Eastern Red Bat	28	160	Bare soil	1	526666	4770314	Y	-
		2	T07	Horned Lark	18	170	Bare soil	1	526985	4770283	Y	-
		3	T10	Chestnut-sided Warbler	47	150	Bare soil	1	528181	4769169	N	N
13-Oct-17	Search Team A	4	T08	Hoary Bat	19	60	Gravel	1	527128	4768875	Y	-
		5	T09	Blackburnian Warbler	35	200	Bare soil	1	527432	4768904	Y	-
		6	T10	Tennessee Warbler	34	310	Bare soil	1	528120	4769223	Y	-
20-Oct-17	Search Team A	7	T01	Hoary Bat	35	160	Bare soil	1	622839	4760815	N	N
		8	T02	Yellow-bellied Sapsucker	15	340	Bare soil	1	523786	4770232	Y	-
		9	T03	Magnolia Warbler	6	190	Gravel	1	523875	4769895	Y	-
24-Oct-17	Search Team A	10	T05	Silver-haired Bat	17	320	Bare soil	1	525904	4768549	Y	-

**Appendix IV**  
Avian Mortalities

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**Appendix IV  
1875A Gunn's Hill WF  
2017 Avian Mortalities**

Visibility Class: 1 ≥90% bare ground, vegetation ≤15cm tall  
 2 ≥25% bare ground, vegetation ≤15cm tall  
 3 ≤25% bare ground, ≤25% of vegetation is >30cm tall  
 4 little or no bare ground, ≥ 25% of vegetation is >30cm tall

Condition Code: I Injured or dying  
 F Freshly dead  
 E Early decomposition  
 M Moderate decomposition  
 A Advanced decomposition  
 C Complete decomposition  
 S Scavenged

Date	Turbine	Start Time	End Time	Dog Used (Y/N)	Days Since Last Search	Temp. (°C)	Cloud Cover (%)	Precipitation	Wind Speed (Beaufort Scale)	Wind Direction	Species	Sample ID	Sex (M/F/U)	Easting	Northing	Distance from Turbine (m)	Direction from Turbine (°)	Condition Code	Estimated Time Since Death (hrs)	Observed Injuries	Substrate/Habitat	Visibility Class
19-May-17	T07	13:17	13:37	N	3	10	80	None	3	NW	Passerine species	1875-190517-T07-01	U	527014	4770343	50	50	S	Unknown	Only feathers remain	Bare soil	1
30-May-17	T09	12:45	13:05	N	4	16	10	None	2 - 5	SW	Common Nighthawk	1875-300517-T09-01	U	527469	4768983	50	30	F	12	Broken neck	Bare soil	1
16-Jun-17	T07	11:47	12:07	N	3	26	10	None	1 - 2	SW	Horned Lark	1875-160617-T07-01	U	526985	4770315	22	10	F	6	Broken neck	Bare soil	1
10-Oct-17	T02	9:19	9:39	N	4	23	20	Fog	1	NW	Ruby-crowned Kinglet	1875-101017-T02-01	M	523805	4770205	19	125	F	14	Broken tail and neck	Gravel	1
13-Oct-17	T08	12:22	12:52	N	3	19	100	Rain	2	SW	Golden-crowned Kinglet	1875-131017-T08-01	U	527138	4768835	41	140	F	24	Only wing remains	Bare soil	1
13-Oct-17	T09	13:13	13:33	N	3	19	100	Rain	2	SW	Golden-crowned Kinglet	1875-131017-T09-01	M	527397	4768931	47	260	E	48	Broken tail	Bare soil	1
27-Oct-17	T01	8:49	9:09	N	3	17	70	None	3	S	Golden-crowned Kinglet	1875-271017-T01-01	M	523311	4770011	41	55	E	48	Broken neck	Bare soil	1

**2017 Raptor Mortalities**

Visibility Class: 1 ≥90% bare ground, vegetation ≤15cm tall  
 2 ≥25% bare ground, vegetation ≤15cm tall  
 3 ≤25% bare ground, ≤25% of vegetation is >30cm tall  
 4 little or no bare ground, ≥ 25% of vegetation is >30cm tall

Condition Code: I Injured or dying  
 F Freshly dead  
 E Early decomposition  
 M Moderate decomposition  
 A Advanced decomposition  
 C Complete decomposition  
 S Scavenged

Date	Turbine	Start Time	End Time	Dog Used (Y/N)	Days Since Last Search	Temp. (°C)	Cloud Cover (%)	Precipitation	Wind Speed (Beaufort Scale)	Wind Direction	Species	Sample ID	Sex (M/F/U)	Easting	Northing	Distance from Turbine (m)	Direction from Turbine (°)	Condition Code	Estimated Time Since Death (hrs)	Observed Injuries	Substrate/Habitat	Visibility Class
16-Jun-17	T04	9:45	10:05	N	3	26	10	None	1 - 2	SW	Red-tailed Hawk	1875-160617-T04-01	U	525543	4768556	48	170	F	24	Broken tail; bloated	Bare soil	1



**Appendix V**  
Bat Mortalities

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**Appendix V**  
**1875A Gunn's Hill WF**  
**2017 Bat Mortalities**

Visibility Class: 1 ≥90% bare ground, vegetation ≤15cm tall  
 2 ≥25% bare ground, vegetation ≤15cm tall  
 3 <25% bare ground, <25% of vegetation is >30cm tall  
 4 little or no bare ground, ≥ 25% of vegetation is >30cm tall

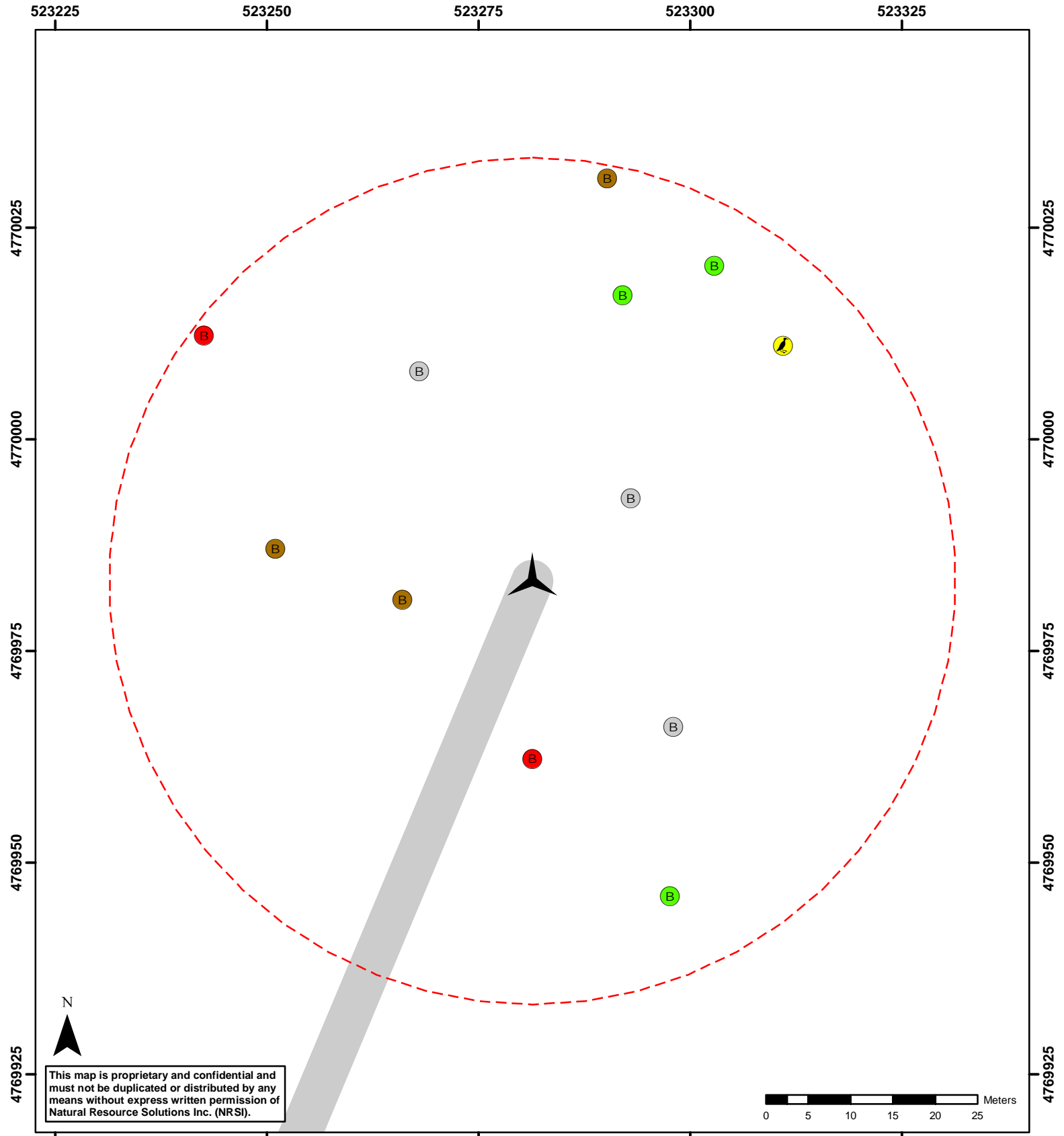
Condition Code: I Injured or dying  
 F Freshly dead  
 E Early decomposition  
 M Moderate decomposition  
 A Advanced decomposition  
 C Complete decomposition  
 S Scavenged

Date	Turbine	Start Time	End Time	Dog Used (Y/N)	Days Since Last Search	Temp. (°C)	Cloud Cover (%)	Precipitation	Wind Speed (Beaufort Scale)	Wind Direction	Species	Sample ID	Bat FA (mm)	Sex (M/F/U)	Easting	Northing	Distance from Turbine (m)	Direction from Turbine (°)	Condition Code	Estimated Time Since Death (hrs)	Observed Injuries	Substrate/Habitat	Visibility Class
19-May-17	T09	12:14	12:34	N	3	10	80	None	3	NW	Silver-haired Bat	1875-190517-T09-02	40	U	527456	4768950	14	60	E	36	Laceration to back	Bare soil	1
23-May-17	T05	12:22	12:42	N	4	17	40	None	2 - 3	SW	Silver-haired Bat	1875-230517-T05-01	43	U	525954	4768572	48	50	F	16	None apparent	Bare soil	1
6-Jun-17	T05	10:59	11:19	N	4	13	100	Rain	2 - 3	N	Hoary Bat	1875-060617-T05-01	50	U	525907	4768550	15	320	F	12	None apparent	Bare soil	1
13-Jun-17	T02	9:13	9:33	N	4	29	70	None	2	SE	Silver-haired Bat	1875-130617-T02-01	40	U	523835	4770229	41	80	E	36	Broken pelvic bone	Bare soil	1
13-Jun-17	T07	12:37	12:57	N	4	29	70	None	2	SE	Silver-haired Bat	1875-130617-T07-01	41	U	526982	4770321	20	10	F	12	Ruptured abdomen	Bare soil	1
23-Jun-17	T06	11:40	12:00	N	3	18	100	None	1	S	Big Brown Bat	1875-230617-T06-01	44	U	526687	4770352	33	65	A	84	Broken wing	Bare soil	1
4-Jul-17	T03	10:18	10:38	N	4	20	0	None	1	NE	Hoary Bat	1875-040717-T03-01	50	U	523865	4769882	21	230	F	8	Laceration to back	Bare soil	1
7-Jul-17	T01	8:41	9:01	N	3	22	100	Rain	1 - 4	W	Big Brown Bat	1875-070717-T01-01	44	U	523251	4769987	27	270	M	65	Laceration to back	Bare soil	1
11-Jul-17	T04	10:23	10:43	N	4	25	70	None	1	W	Hoary Bat	1875-110717-T04-01	52	U	525563	4768602	25	105	F	8	Broken uropotagium	Bare soil	1
14-Jul-17	T04	10:26	10:46	N	3	20	100	Fog	1	NW	Big Brown Bat	1875-140717-T04-01	43	U	525548	4768594	12	130	F	10	Broken uropotagium	Bare soil	1
18-Jul-17	T07	12:07	12:27	N	4	27	20	None	1	W	Hoary Bat	1875-180717-T07-01	54	U	527011	4770285	26	110	F	8	Broken uropotagium	Bare soil	1
18-Jul-17	T08	12:46	13:06	N	4	27	20	None	1	W	Hoary Bat	1875-180717-T08-01	55	F	527121	4768867	5	60	F	9	None apparent	Gravel	1
18-Jul-17	T10	13:52	14:12	N	4	27	20	None	1	W	Hoary Bat	1875-180717-T10-01	55	U	528170	4769173	38	150	F	12	None apparent	Bare soil	1
18-Jul-17	T10	13:52	14:12	N	4	27	20	None	1	W	Hoary Bat	1875-180717-T10-02	51	F	528162	4769213	8	70	F	12	None apparent	Gravel	1
18-Jul-17	T10	13:52	14:12	N	4	27	20	None	1	W	Big Brown Bat	1875-180717-T10-03	43	U	528169	4769195	21	125	A	104	None apparent	Bare soil	1
21-Jul-17	T05	10:42	11:02	N	3	27	20	None	2	N	Hoary Bat	1875-210717-T05-01	55	U	525935	4768530	18	120	F	8	Broken uropotagium	Bare soil	1
21-Jul-17	T06	11:20	11:40	N	3	27	20	None	2	N	Hoary Bat	1875-210717-T06-01	56	U	526628	4770347	27	280	F	10	None apparent	Bare soil	1
21-Jul-17	T07	11:58	12:18	N	3	27	20	None	2	N	Hoary Bat	1875-210717-T07-01	52	U	526967	4770338	38	350	E	34	Broken wing	Bare soil	1
21-Jul-17	T08	12:38	12:58	N	3	27	20	None	2	N	Hoary Bat	1875-210717-T08-01	55	U	527144	4768837	38	130	F	10	None apparent	Bare soil	1
21-Jul-17	T10	13:51	14:11	N	3	27	20	None	2	N	Hoary Bat	1875-210717-T10-01	55	U	528188	4769211	33	80	A	82	None apparent	Bare soil	1
25-Jul-17	T01	8:42	9:02	N	4	19	30	None	1 - 3	NE	Hoary Bat	1875-250717-T01-01	53	U	523298	4769946	38	150	E	32	None apparent	Bare soil	1
25-Jul-17	T06	11:11	11:31	N	4	19	30	None	1 - 3	NE	Hoary Bat	1875-250717-T06-01	50	U	526657	4770298	46	180	F	10	None apparent	Bare soil	1
25-Jul-17	T09	12:41	13:01	N	4	19	30	None	1 - 3	NE	Hoary Bat	1875-250717-T09-01	54	U	527410	4768913	44	240	F	10	Broken wing	Bare soil	1
25-Jul-17	T10	13:16	13:36	N	4	19	30	None	1 - 3	NE	Hoary Bat	1875-250717-T10-01	50	U	528148	4769194	12	230	F	10	None apparent	Gravel	1
28-Jul-17	T05	8:56	9:16	N	3	20	90	None	1 - 4	NE	Hoary Bat	1875-280717-T05-01	54	U	525968	4768545	45	50	E	30	None apparent	Bare soil	1
28-Jul-17	T06	9:30	9:50	N	3	20	90	None	1 - 4	NE	Hoary Bat	1875-280717-T06-01	58	U	526674	4770353	22	55	E	30	Broken right wing	Bare soil	1
28-Jul-17	T10	11:25	11:45	N	3	20	90	None	1 - 4	NE	Big Brown Bat	1875-280717-T10-01	43	F	528131	4769233	28	335	E	30	Laceration to abdomen	Bare soil	1
1-Aug-17	T02	9:07	9:27	N	4	28	20	None	1 - 2	W	Big Brown Bat	1875-010817-T02-01	44	U	523787	4770191	24	200	F	10	Laceration to back	Bare soil	1
1-Aug-17	T07	11:56	12:16	N	4	28	20	None	1 - 2	W	Hoary Bat	1875-010817-T07-01	56	U	527010	4770272	36	135	F	12	Broken left wing	Bare soil	1
1-Aug-17	T08	12:34	12:54	N	4	28	20	None	1 - 2	W	Hoary Bat	1875-010817-T08-01	55	U	527092	4768830	42	215	F	12	Both wings broken	Bare soil	1
4-Aug-17	T01	8:40	9:00	N	3	23	100	Rain	3 - 6	S	Big Brown Bat	1875-040817-T01-01	42	U	523290	4770031	49	25	F	8	Crushed skull	Bare soil	1
4-Aug-17	T05	10:44	11:04	N	3	23	100	Rain	3 - 6	S	Hoary Bat	1875-040817-T05-01	50	U	525941	4768558	27	45	E	30	None apparent	Bare soil	1

Date	Turbine	Start Time	End Time	Dog Used (Y/N)	Days Since Last Search	Temp. (°C)	Cloud Cover (%)	Precipitation	Wind Speed (Beaufort Scale)	Wind Direction	Species	Sample ID	Bat FA (mm)	Sex (M/F/U)	Easting	Northing	Distance from Turbine (m)	Direction from Turbine (°)	Condition Code	Estimated Time Since Death (hrs)	Observed Injuries	Substrate/Habitat	Visibility Class
4-Aug-17	T10	13:16	13:36	N	3	23	100	Rain	3 - 6	S	Hoary Bat	1875-040817-T10-01	52	U	528189	4769198	46	100	E	32	Laceration to abdomen	Bare soil	1
4-Aug-17	T10	13:16	13:36	N	3	23	100	Rain	3 - 6	S	Big Brown Bat	1875-040817-T10-02	42	U	528198	4769219	47	75	M	56	Only wing and spine remain	Bare soil	1
8-Aug-17	T07	12:05	12:25	N	4	25	50	None	1 - 2	NW	Hoary Bat	1875-080817-T07-01	55	U	527005	4770296	24	90	A	80	Laceration to back	Bare soil	1
11-Aug-17	T04	10:05	10:25	N	3	21	95	None	2	W	Hoary Bat	1875-110817-T04-01	55	U	525500	4768597	41	265	A	80	None apparent	Bare soil	1
15-Aug-17	T07	12:10	12:30	N	4	25	80	Rain	1	SW	Hoary Bat	1875-150817-T07-01	52	M	526974	4770322	24	340	E	36	None apparent	Bare soil	1
15-Aug-17	T07	12:10	12:30	N	4	25	80	Rain	1	SW	Eastern Red Bat	1875-150817-T07-02	41	U	526970	4770286	19	235	E	36	None apparent	Bare soil	1
15-Aug-17	T08	13:00	13:20	N	4	25	80	Rain	1	SW	Hoary Bat	1875-150817-T08-01	52	M	527132	4768873	24	80	F	12	Broken left wing	Gravel	1
18-Aug-17	T01	8:46	9:06	N	3	24	80	None	3 - 5	SW	Big Brown Bat	1875-180817-T01-01	44	M	523266	4769981	13	305	F	11	Laceration to back	Bare soil	1
18-Aug-17	T09	12:50	13:10	N	3	24	80	None	3 - 5	SW	Hoary Bat	1875-180817-T09-01	55	F	527396	4768949	42	300	F	12	Blood in nose	Bare soil	1
18-Aug-17	T05	13:55	14:15	N	3	24	80	None	3 - 5	SW	Hoary Bat	1875-180817-T05-01	55	F	525898	4768549	26	315	F	12	Broken left wing	Bare soil	1
22-Aug-17	T01	8:31	8:51	N	4	23	100	Rain	3 - 6	SW	Silver-haired Bat	1875-220817-T01-01	40	M	523268	4770008	35	345	E	30	None apparent	Bare soil	1
22-Aug-17	T03	9:29	9:49	N	4	23	100	Rain	3 - 6	SW	Silver-haired Bat	1875-220817-T03-01	40	M	523925	4769908	47	80	M	50	Laceration to head	Bare soil	1
22-Aug-17	T05	10:33	10:53	N	4	23	100	Rain	3 - 6	SW	Big Brown Bat	1875-220817-T05-01	44	F	525922	4768540	<1	50	F	8	None apparent	Gravel	1
25-Aug-17	T01	8:56	9:16	N	3	21	10	None	1	N	Hoary Bat	1875-250817-T01-01	55	U	523303	4770021	43	30	F	8	None apparent	Bare soil	1
25-Aug-17	T08	12:42	13:07	N	3	21	10	None	1	N	Eastern Red Bat	1875-250817-T08-01	42	U	527128	4768871	13	60	E	34	None apparent	Gravel	1
25-Aug-17	T09	13:15	13:35	N	3	21	10	None	1	N	Eastern Red Bat	1875-250817-T09-01	42	F	527443	4768912	26	175	F	14	None apparent	Bare soil	1
1-Sep-17	T01	8:44	9:04	N	3	18	70	None	1 - 3	NE	Eastern Red Bat	1875-010917-T01-01	40	F	523281	4769962	21	180	F	8	Laceration to back	Bare soil	1
1-Sep-17	T01	8:44	9:04	N	3	18	70	None	1 - 3	NE	Silver-haired Bat	1875-010917-T01-02	39	M	523293	4769993	17	50	F	11	None apparent	Bare soil	1
1-Sep-17	T01	8:44	9:04	N	3	18	70	None	1 - 3	NE	Eastern Red Bat	1875-010917-T01-03	40	F	523243	4770012	49	320	E	34	Laceration to back	Bare soil	1
1-Sep-17	T06	11:40	12:00	N	3	18	70	None	1 - 3	NE	Big Brown Bat	1875-010917-T06-01	44	F	526625	4770311	48	240	F	11	None apparent	Bare soil	1
1-Sep-17	T07	12:19	12:39	N	3	18	70	None	1 - 3	NE	Silver-haired Bat	1875-010917-T07-01	39	M	526954	4770267	46	225	F	12	None apparent	Bare soil	1
1-Sep-17	T08	12:58	13:18	N	3	18	70	None	1 - 3	NE	Silver-haired Bat	1875-010917-T08-01	40	F	527072	4768861	39	270	E	34	None apparent	Bare soil	1
5-Sep-17	T02	9:11	9:31	N	4	20	80	Rain/Fog	2 - 4	W	Silver-haired Bat	1875-050917-T02-01	44	F	523818	4770201	26	140	F	10	None apparent	Bare soil	1
5-Sep-17	T04	10:24	10:44	N	4	20	80	Rain/Fog	2 - 4	W	Silver-haired Bat	1875-050917-T04-01	41	M	525561	4768596	30	90	F	10	None apparent	Gravel	1
8-Sep-17	T01	8:51	9:11	N	3	15	80	Rain	2	NW	Silver-haired Bat	1875-080917-T01-01	41	M	523298	4769966	23	120	E	30	None apparent	Bare soil	1
12-Sep-17	T04	10:19	10:39	N	4	24	10	None	0 - 1	S	Silver-haired Bat	1875-120917-T04-01	40	F	525499	4768615	32	305	F	10	None apparent	Bare soil	1
12-Sep-17	T04	10:19	10:39	N	4	24	10	None	0 - 1	S	Silver-haired Bat	1875-120917-T04-02	39	U	525534	4768569	35	185	E	30	None apparent	Bare soil	1
12-Sep-17	T05	11:09	11:29	N	4	24	10	None	0 - 1	S	Silver-haired Bat	1875-120917-T05-01	39	M	525896	4768528	25	275	F	10	None apparent	Bare soil	1
19-Sep-17	T05	10:42	11:02	N	4	27	70	None	0 - 1	SE	Hoary Bat	1875-190917-T05-01	52	F	525895	4768547	25	300	E	30	Laceration to back	Bare soil	1
19-Sep-17	T09	13:06	13:26	N	4	27	70	None	0 - 1	SE	Silver-haired Bat	1875-190917-T09-01	41	F	527416	4768961	33	320	E	30	None apparent	Bare soil	1
26-Sep-17	T04	8:54	9:14	N	4	31	10	None	0 - 1	SW	Silver-haired Bat	1875-260917-T04-01	40	U	525553	4768619	21	60	E	30	Laceration to abdomen	Bare soil	1
3-Oct-17	T04	10:30	10:50	N	4	27	10	Fog	2 - 4	S	Silver-haired Bat	1875-031017-T04-01	41	M	525496	4768624	43	310	F	10	Laceration to abdomen	Bare soil	1
6-Oct-17	T05	9:19	9:39	N	3	16	90	Rain	0	NW	Silver-haired Bat	1875-061017-T05-01	40	M	525935	4768555	21	40	M	55	Laceration to back	Bare soil	1
6-Oct-17	T08	10:50	11:10	N	3	16	90	Rain	0	NW	Silver-haired Bat	1875-061017-T08-01	42	F	527131	4768855	26	125	E	30	None apparent	Bare soil	1
6-Oct-17	T09	11:19	11:39	N	3	16	90	Rain	0	NW	Hoary Bat	1875-061017-T09-01	55	F	527443	4768913	24	170	F	10	None apparent	Bare soil	1
17-Oct-17	T01	8:46	9:06	N	4	18	20	None	3 - 5	W	Hoary Bat	1875-171017-T01-01	55	M	523292	4770017	42	20	F	10	Broken right wing; laceration to back	Bare soil	1

**Appendix VI**  
Locations of Bird and Bat Mortalities









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**Legend**

-  Turbine
-  Search Radius (50m)
-  Access Road
-  Big Brown Bat
-  Eastern Red Bat
-  Hoary Bat
-  Silver-haired Bat
-  Golden-crowned Kinglet

Appendix VI


**Gunn's Hill WF**

**Turbine 01 Mortalities 2017**

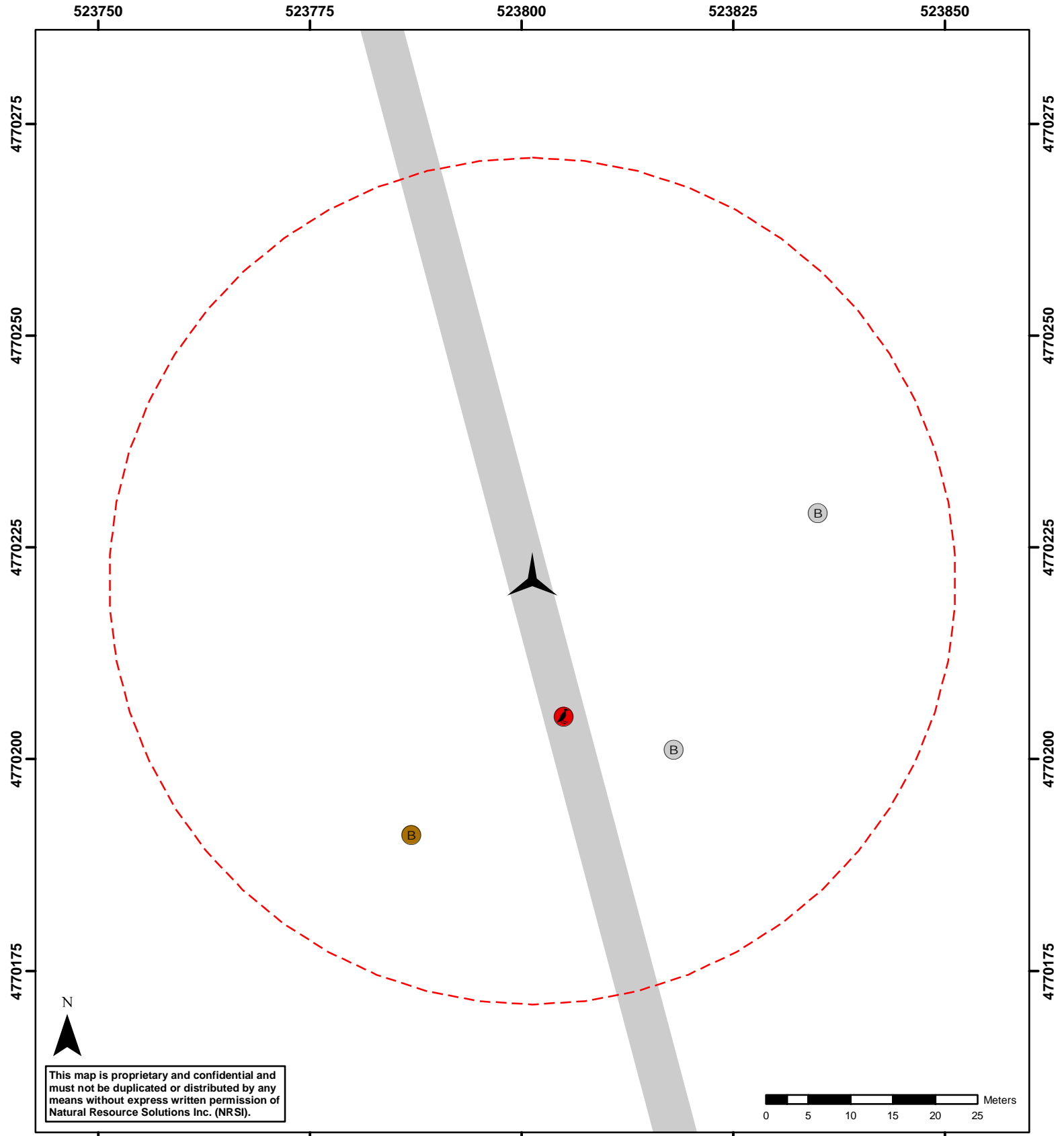
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NAD83 - UTM Zone 17  
Scale: 1:600 (8.5x11")

Date: January 9, 2018  
Project: 1875A



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- Legend**
- Turbine
  - Search Radius (50m)
  - Access Road
  - Big Brown Bat
  - Silver-haired Bat
  - Ruby-crowned Kinglet

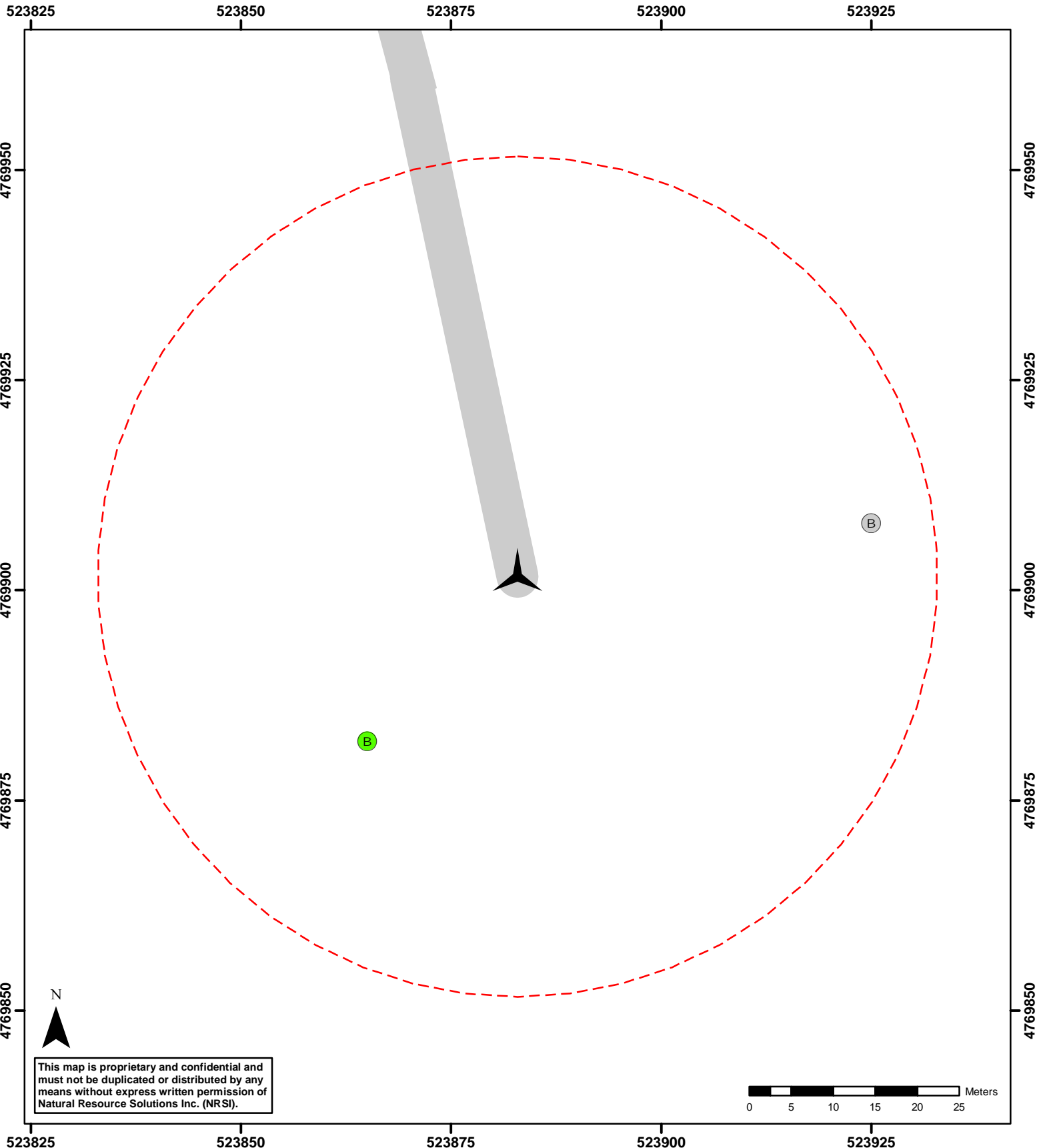
Appendix VI

## Gunn's Hill WF

### Turbine 02 Mortalities 2017






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**Legend**


-  Turbine
-  Search Radius (50m)
-  Access Road
-  Hoary Bat
-  Silver-haired Bat

Appendix VI

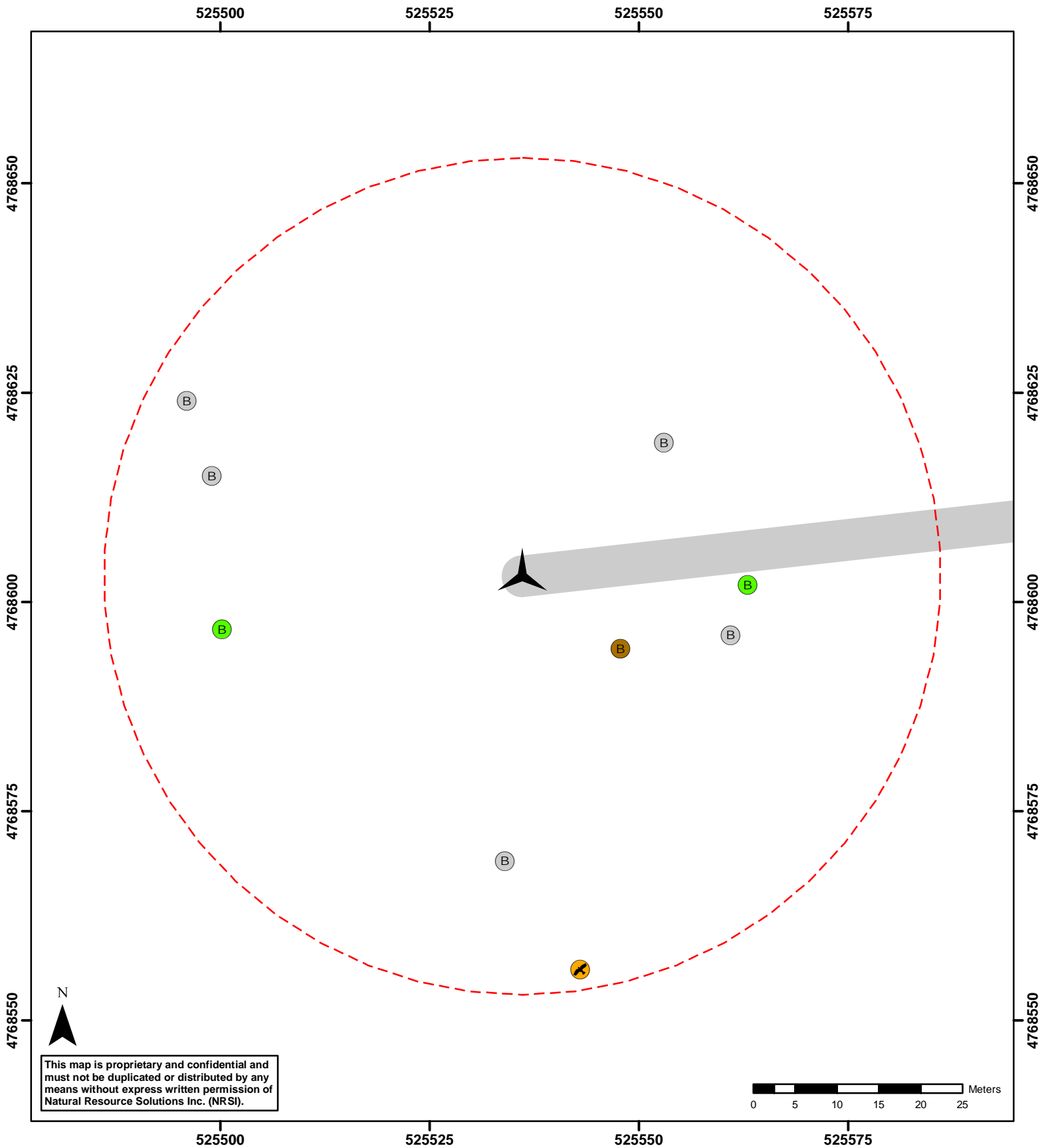
## Gunn's Hill WF

### Turbine 03 Mortalities 2017








NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2018 Project: 1875A
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**Legend**

-  Turbine
-  Search Radius (50m)
-  Access Road
-  Big Brown Bat
-  Hoary Bat
-  Silver-haired Bat
-  Red-tailed Hawk

Appendix VI

**Gunn's Hill WF**  
**Turbine 04 Mortalities 2017**

NAD83 - UTM Zone 17  
Scale: 1:600 (8.5x11")

Date: January 9, 2018  
Project: 1875A





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525900

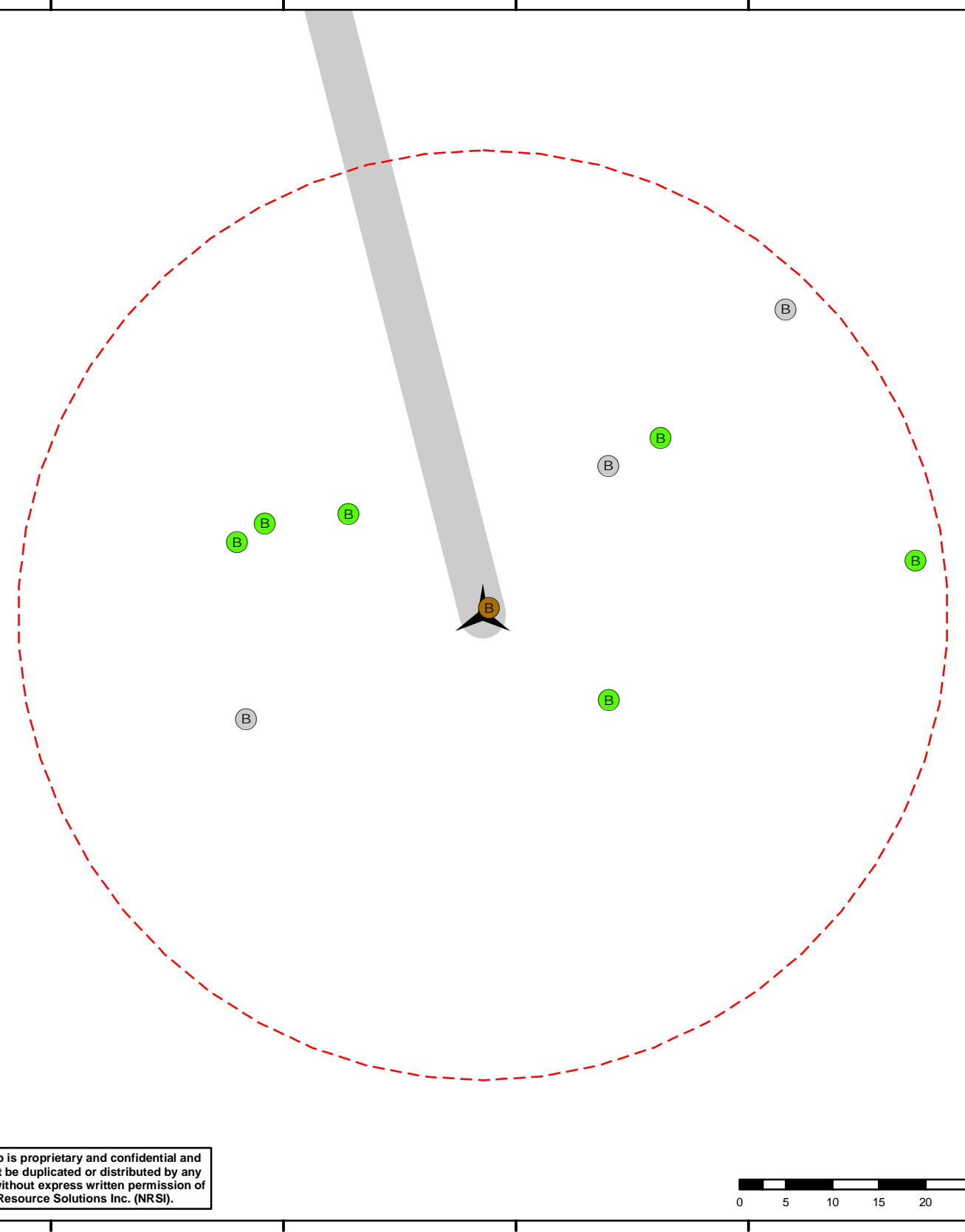
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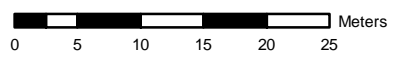
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**Legend**


-  Turbine
-  Search Radius (50m)
-  Access Road
-  Big Brown Bat
-  Hoary Bat
-  Silver-haired Bat

Appendix VI

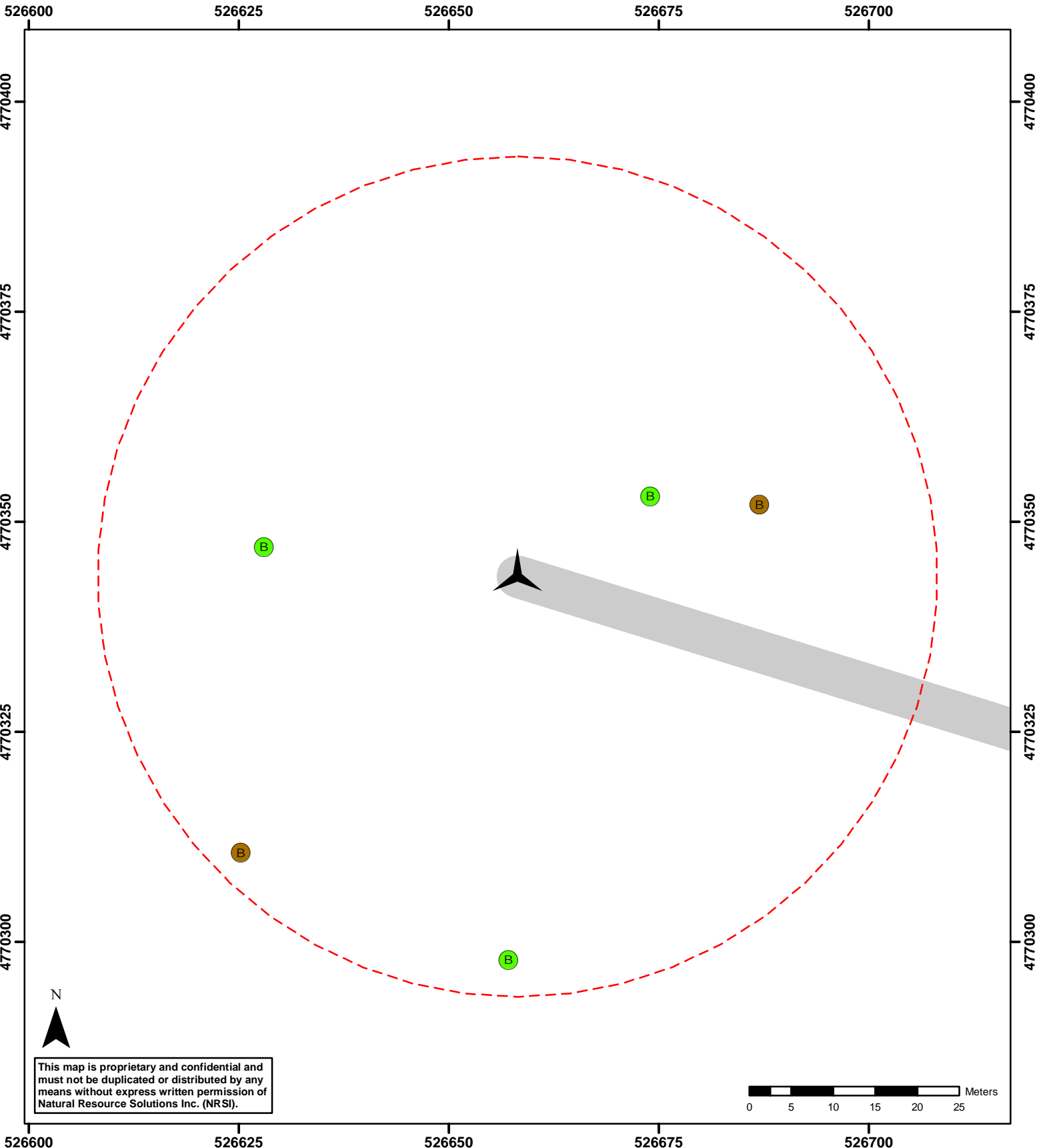
## Gunn's Hill WF

### Turbine 05 Mortalities 2017

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2018 Project: 1875A
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**Legend**


-  Turbine
-  Search Radius (50m)
-  Access Road
-  Big Brown Bat
-  Hoary Bat

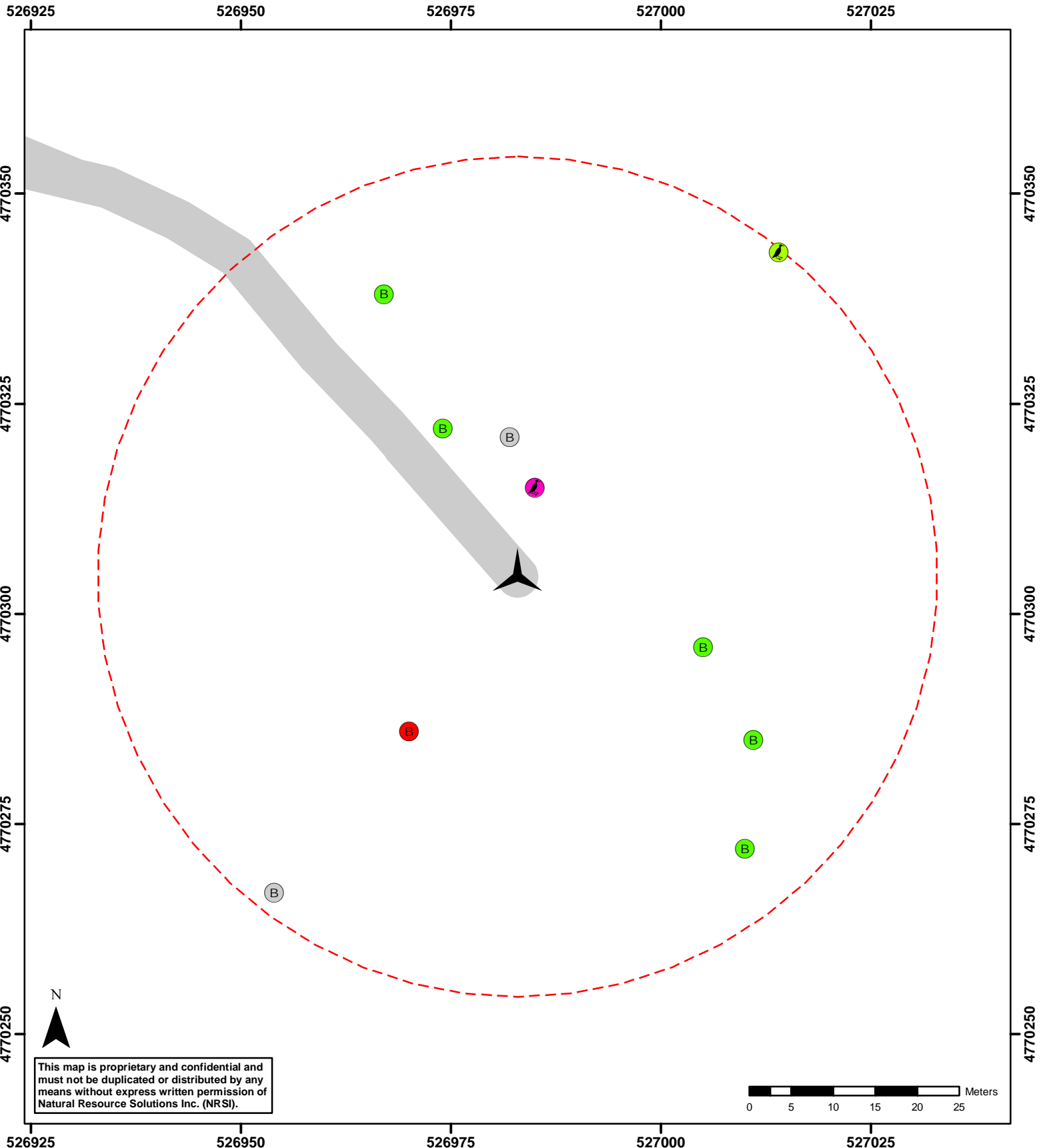
Appendix VI

## Gunn's Hill WF

### Turbine 06 Mortalities 2017

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2018 Project: 1875A
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**Legend**

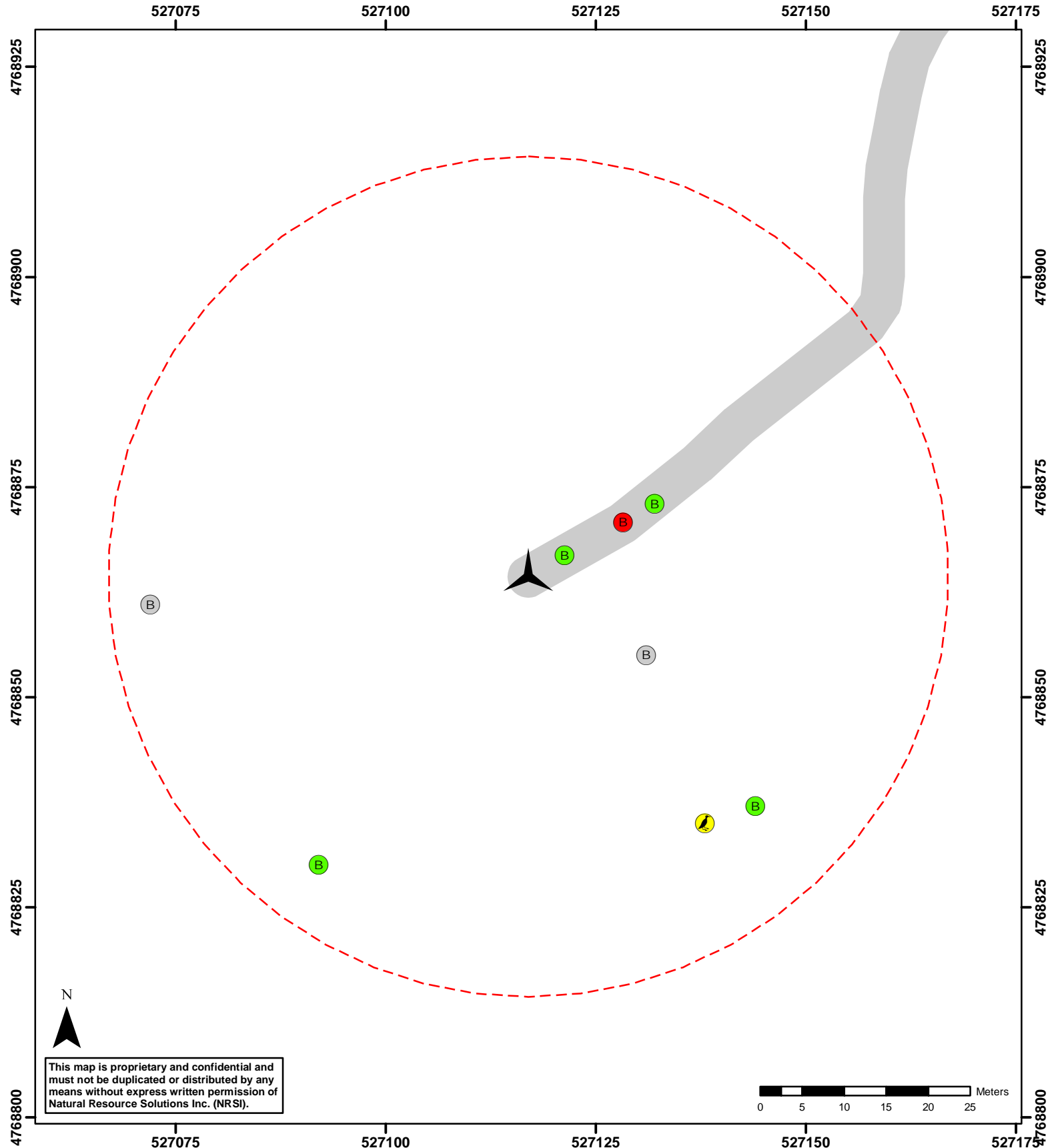
- Turbine
- Search Radius (50m)
- Access Road
- Eastern Red Bat
- Hoary Bat
- Silver-haired Bat
- Horned Lark
- Passerine species

Appendix VI

## Gunn's Hill WF








### Turbine 07 Mortalities 2017

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2018 Project: 1875A
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**Legend**


-  Turbine
-  Search Radius (50m)
-  Access Road
-  Eastern Red Bat
-  Hoary Bat
-  Silver-haired Bat
-  Golden-crowned Kinglet

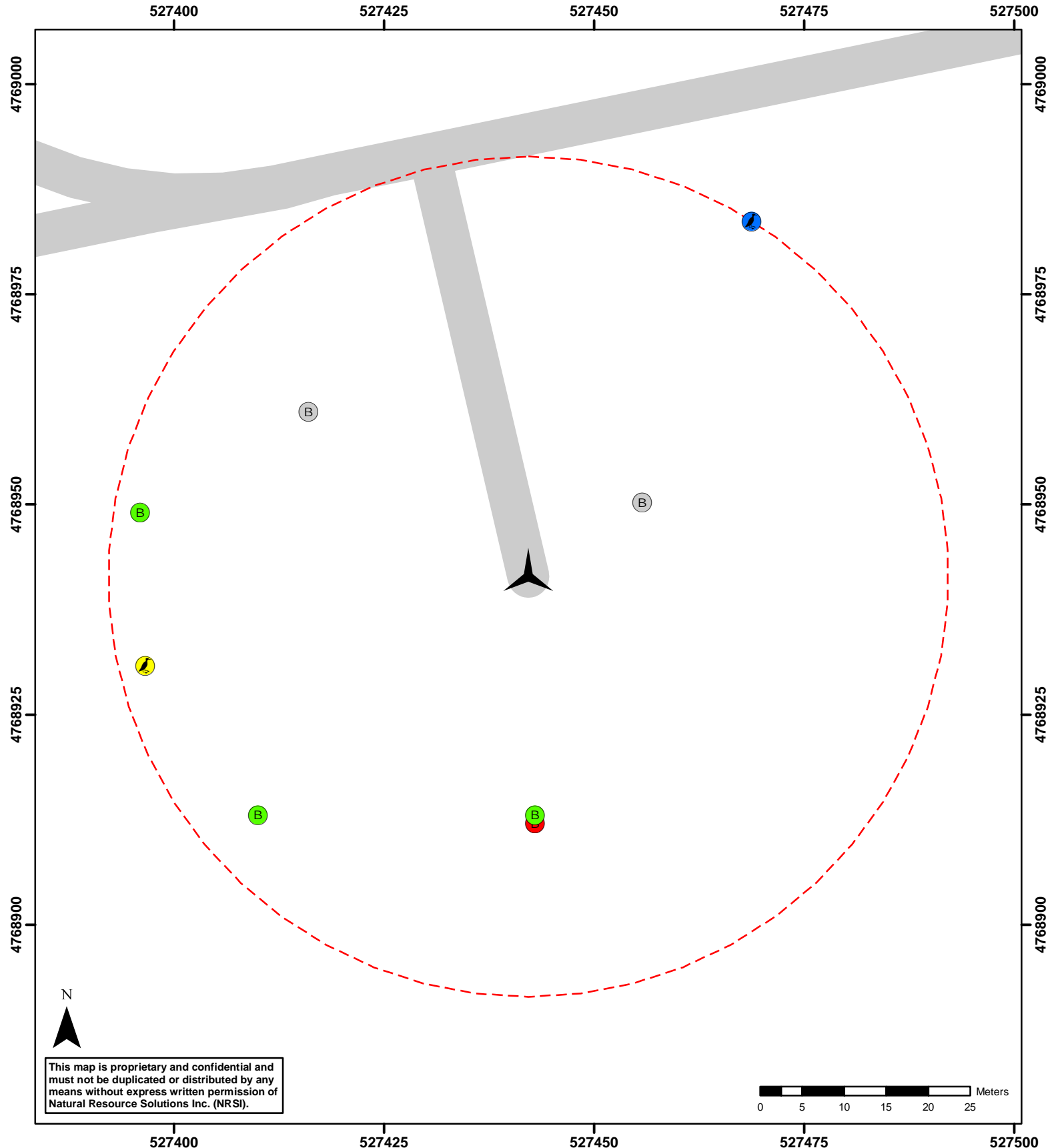
Appendix VI

## Gunn's Hill WF

### Turbine 08 Mortalities 2017

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2018 Project: 1875A
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- Legend**
- Turbine
  - Search Radius (50m)
  - Access Road
  - Eastern Red Bat
  - Hoary Bat
  - Silver-haired Bat
  - Common Nighthawk
  - Golden-crowned Kinglet

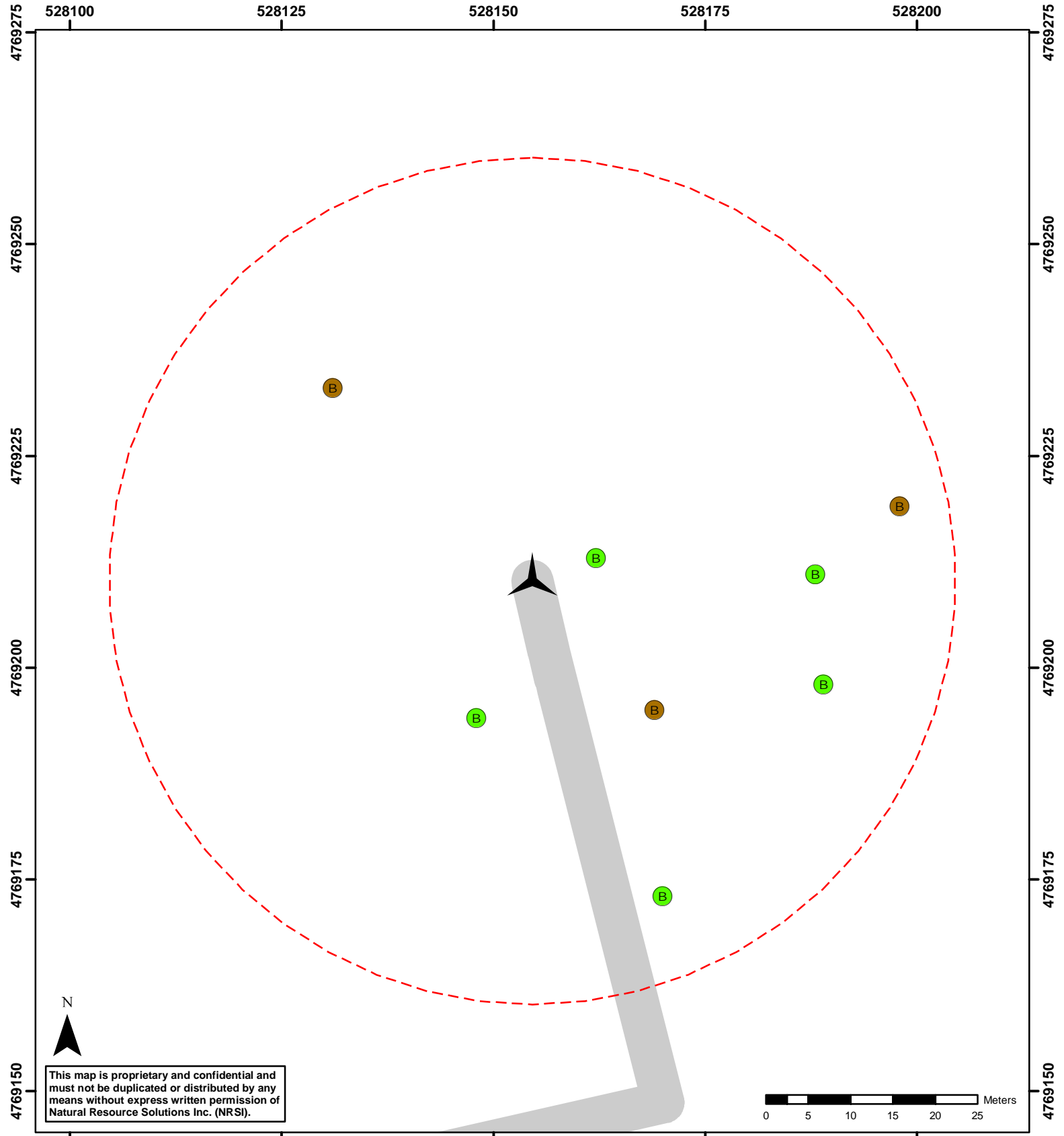
Appendix VI

## Gunn's Hill WF

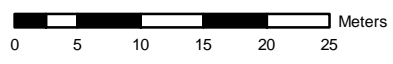
### Turbine 09 Mortalities 2017

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2018 Project: 1875A
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**Legend**


-  Turbine
-  Search Radius (50m)
-  Access Road
-  Big Brown Bat
-  Hoary Bat

Appendix VI

## Gunn's Hill WF

### Turbine 10 Mortalities 2017

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2018 Project: 1875A
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**Appendix VII**  
Visibility Class Mapping

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# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 1

Degree of Slope 0 degrees

Slope Orientation N/A (e.g. SSW)

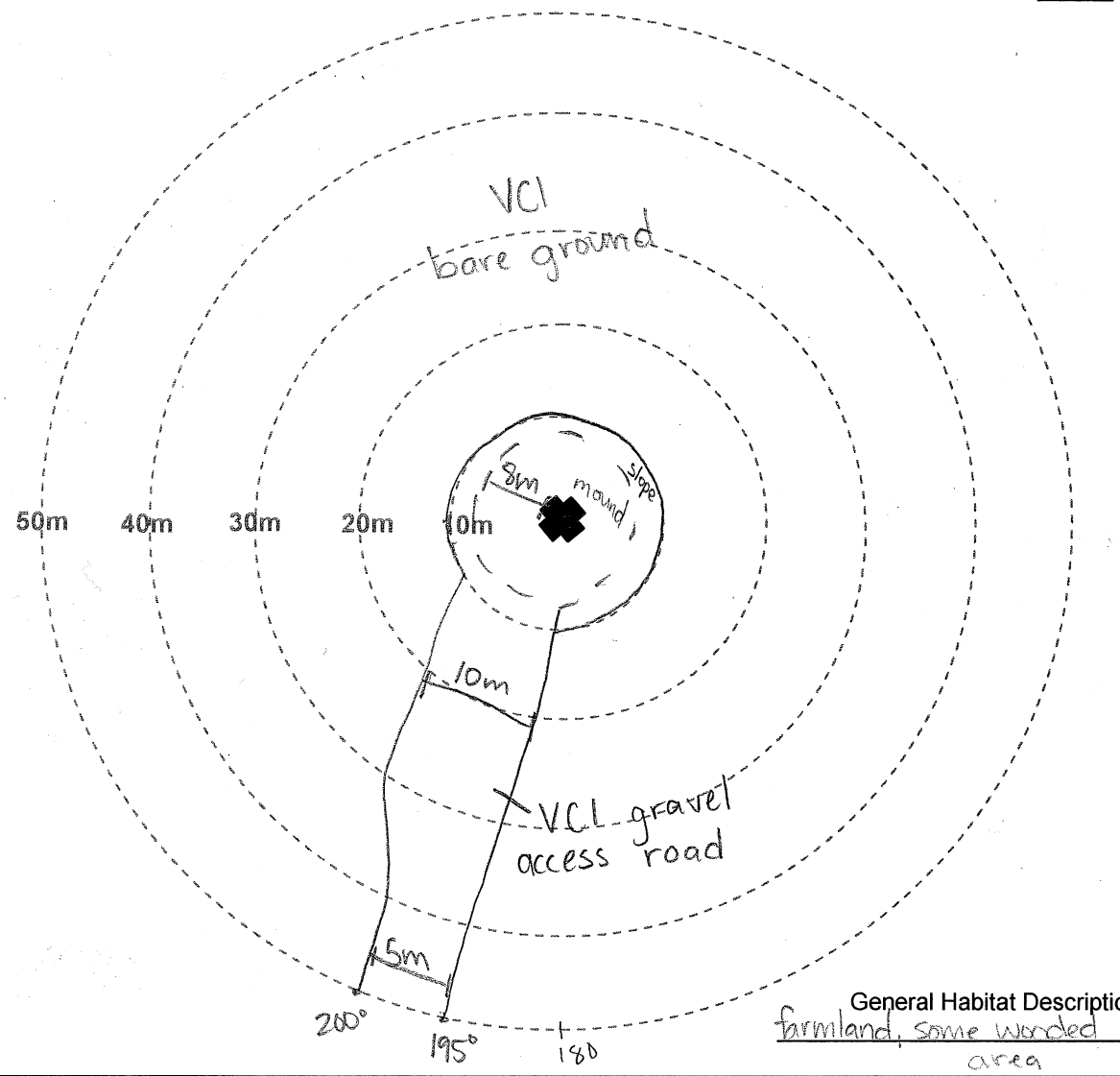
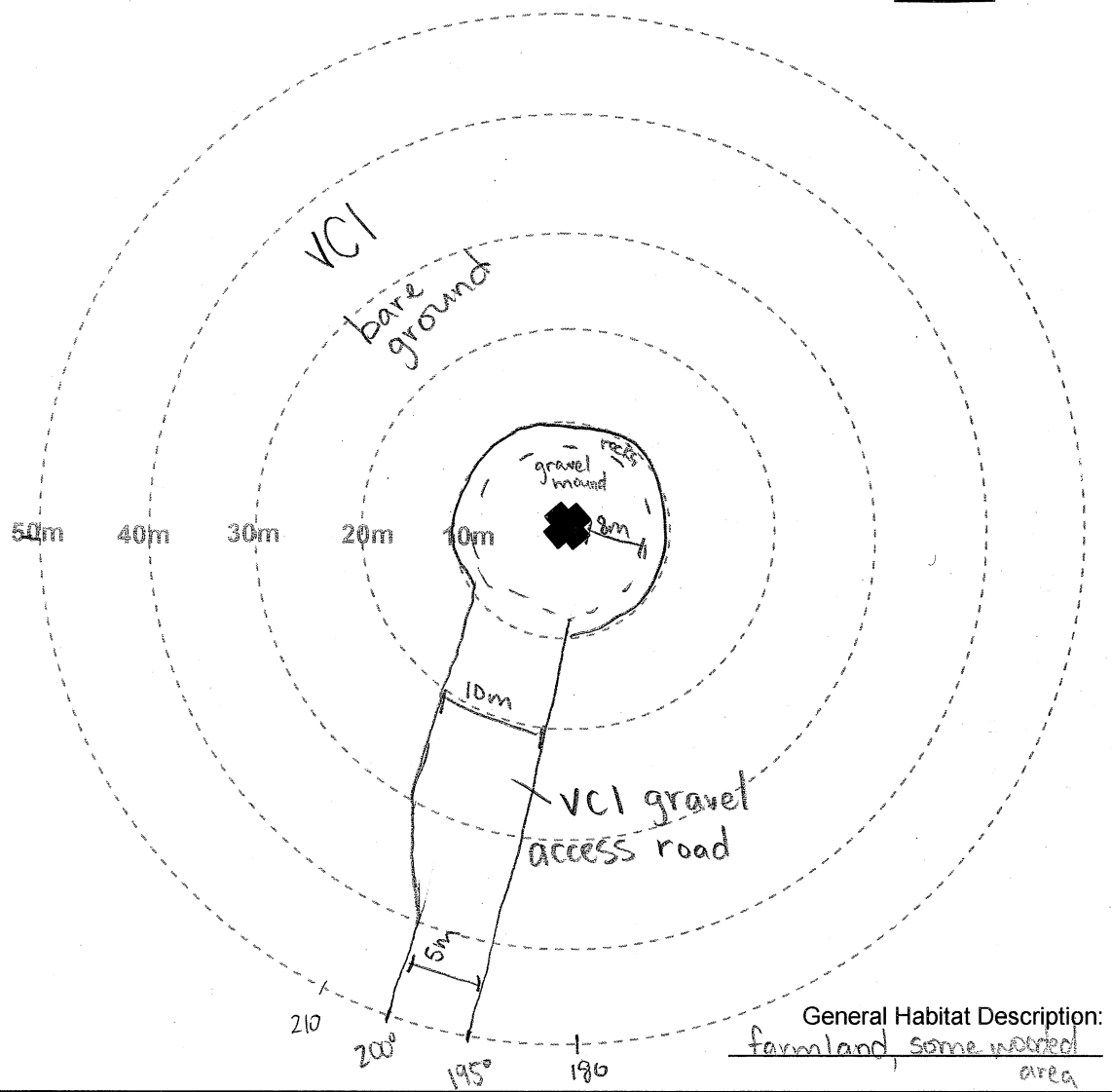
Photo Numbers (from turbine base)  
 Facing North: 1473  
 Facing East: 1474  
 Facing South: 1475  
 Facing West: 1476  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 12/05/17  
 Observer: Shelby H., Karl  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



Photo Numbers (from turbine base)  
 Facing North: 1605  
 Facing East: 1606  
 Facing South: 1607  
 Facing West: 1608  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 06/06/17  
 Observer: Shelby H., Henry A  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats



# Visibility Class Map

Project Name: Gunn's Hill Project #: 1875A Turbine #: 01

Photo Numbers (from turbine base)  
 Facing North: 1753  
 Facing East: 1754  
 Facing South: 1755  
 Facing West: 1756  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04/07/17  
 Observer: Shelby H., Henry A  
 Monthly/Seasonal  
 Linear Transect Width: 5 m

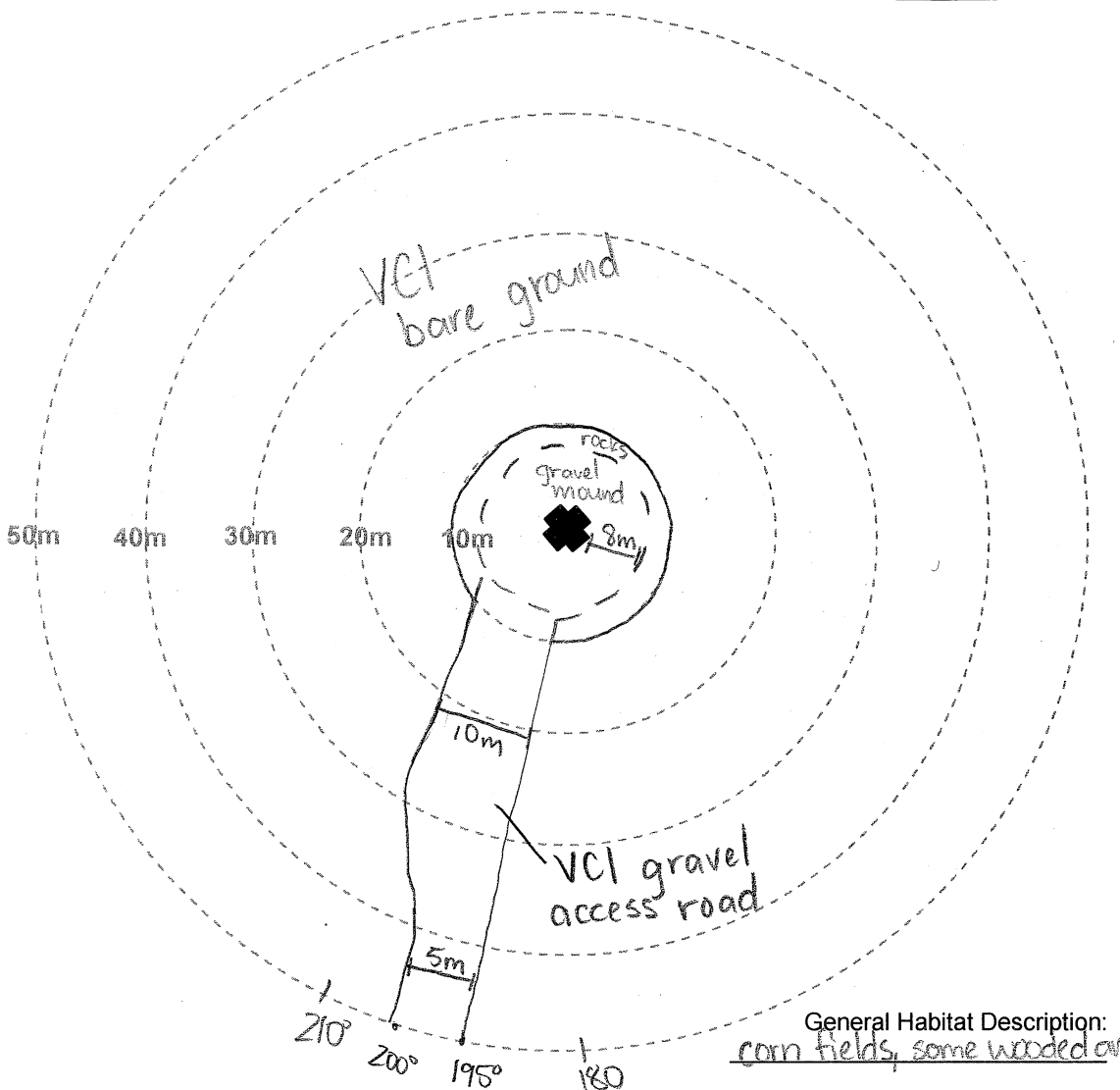
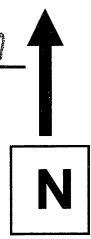
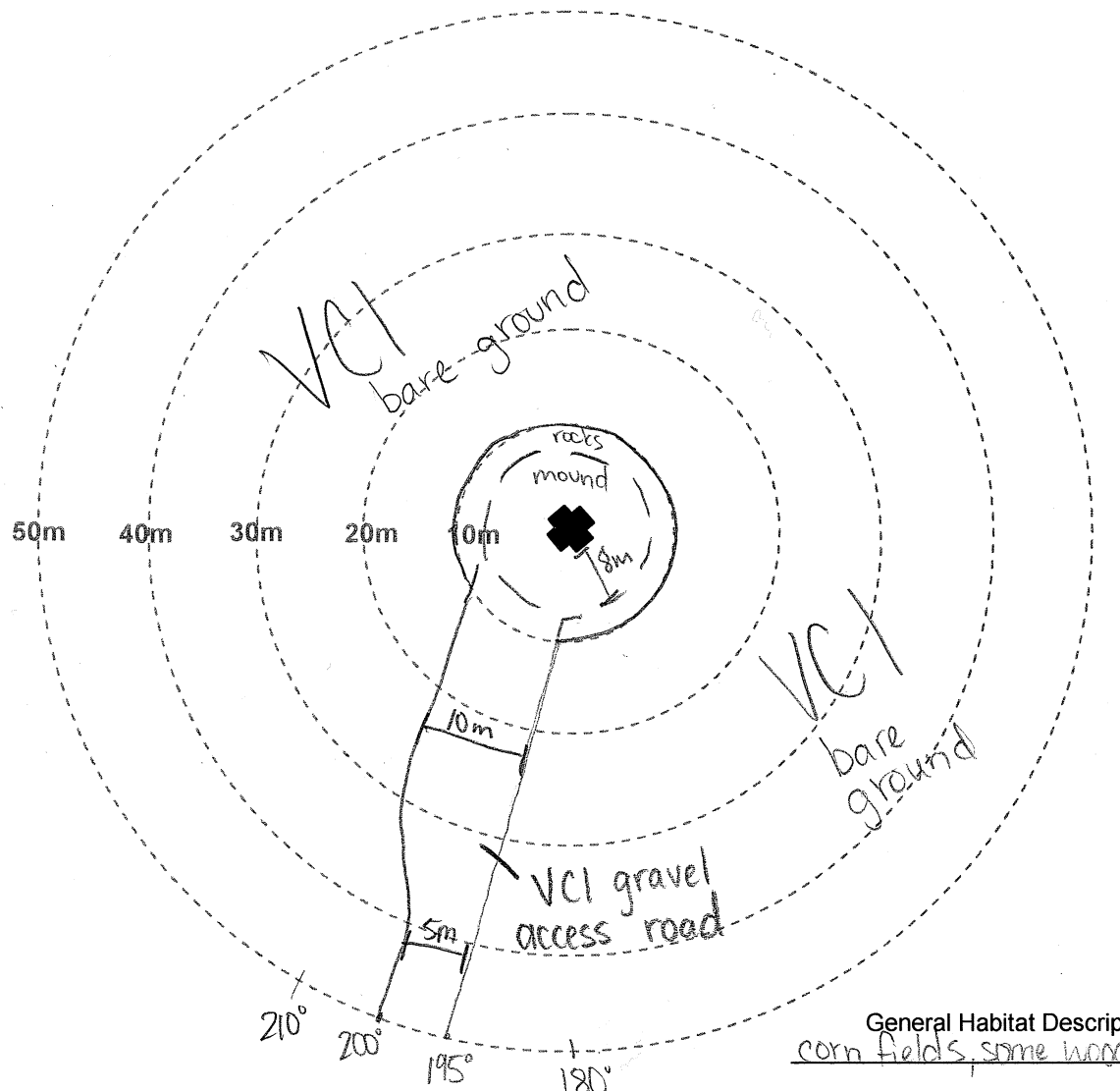
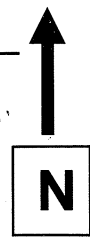


Photo Numbers (from turbine base)  
 Facing North: 2015  
 Facing East: 2016  
 Facing South: 2017  
 Facing West: 2018  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04/08/17  
 Observer: Shelby H., Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 01

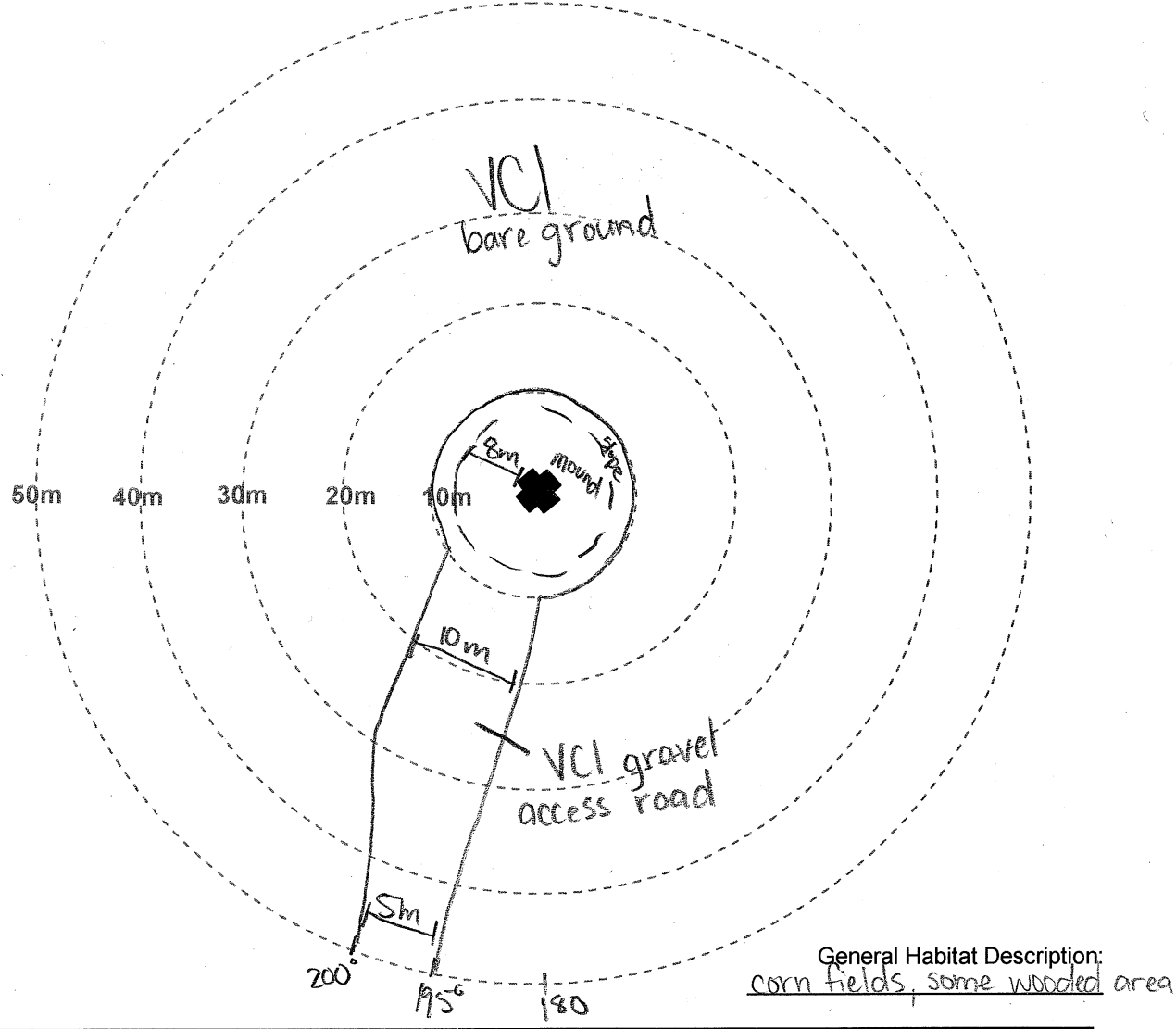
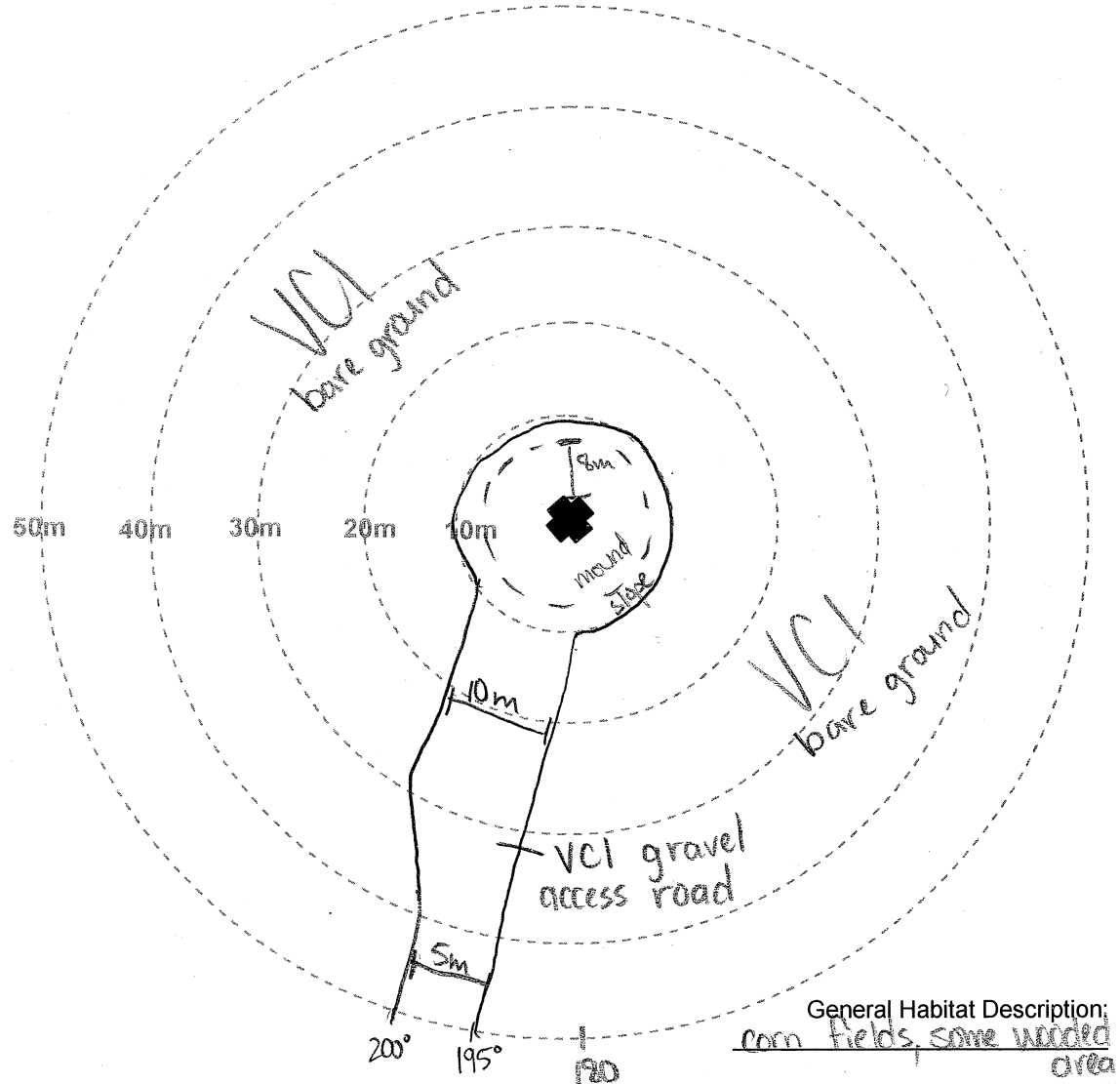
Photo Numbers (from turbine base)  
 Facing North: 2347  
 Facing East: 2348  
 Facing South: 2349  
 Facing West: 2350  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 15/09/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



Photo Numbers (from turbine base)  
 Facing North: 2414  
 Facing East: 2415  
 Facing South: 2416  
 Facing West: 2417  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 187SA

Turbine #: 2

Degree of Slope 0 degrees

Slope Orientation N/A (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 111-1390 (922)  
 Facing East: 111-1392 (923)  
 Facing South: 111-1393 (924)  
 Facing West: 111-1395 (925)  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/05/17

Observer: Shelby H.

Monthly/Seasonal  
 Linear Transect Width: 5 m

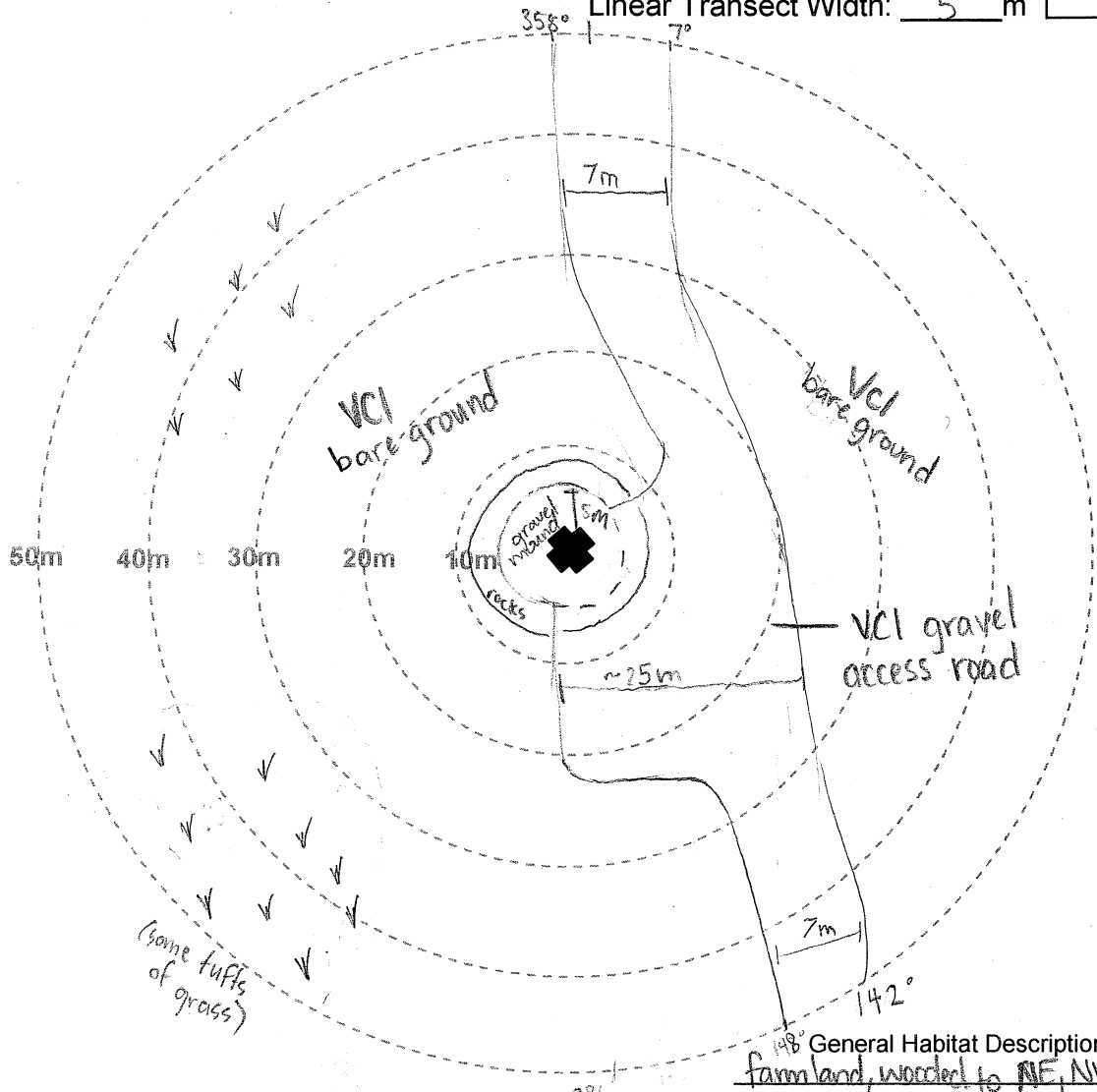
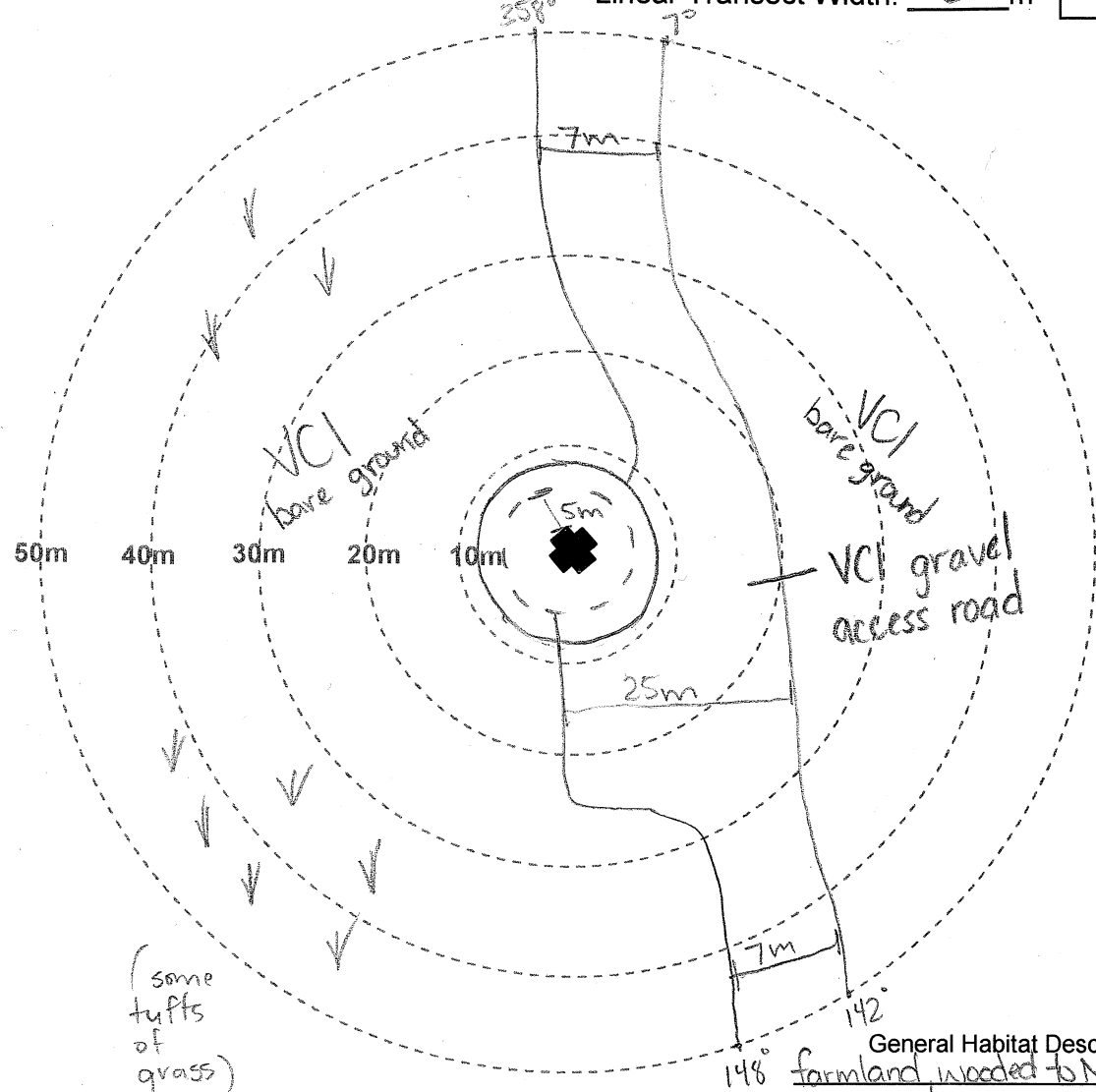


Photo Numbers (from turbine base)  
 Facing North: 1609  
 Facing East: 1610  
 Facing South: 1611  
 Facing West: 1612  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 06/06/17

Observer: Shelby H., Henry A

Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 02

Photo Numbers (from turbine base)

Facing North: 1758  
 Facing East: 1759  
 Facing South: 1760  
 Facing West: 1761

(sketch habitat and visibility classes)

Date (DD/MM/YY): 04 / 07 / 17

Observer: Shelby H. Henry A

Monthly/Seasonal  
 Linear Transect Width: 5 m

N

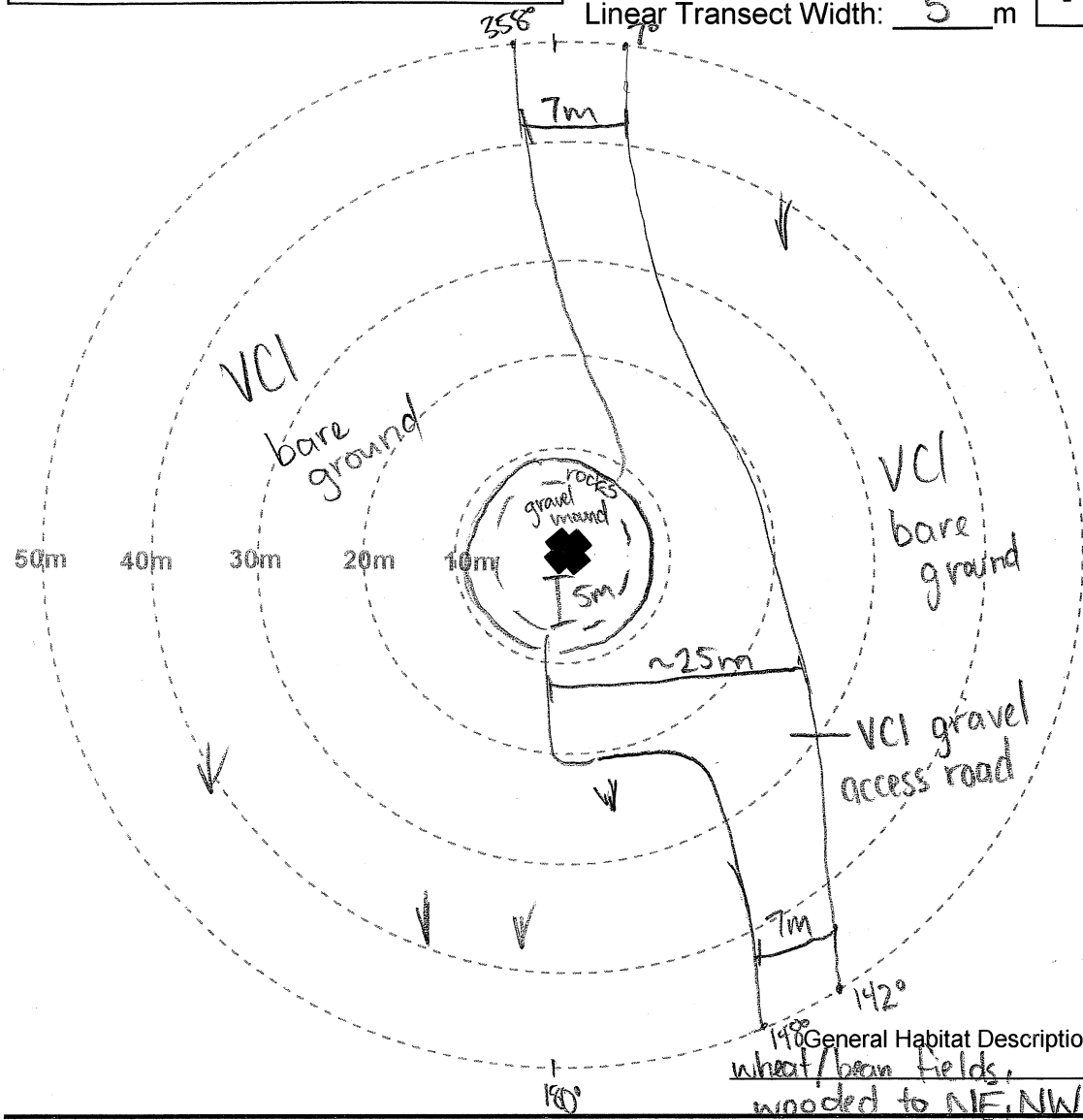


Photo Numbers (from turbine base)

Facing North: 2023  
 Facing East: 2024  
 Facing South: 2025  
 Facing West: 2026

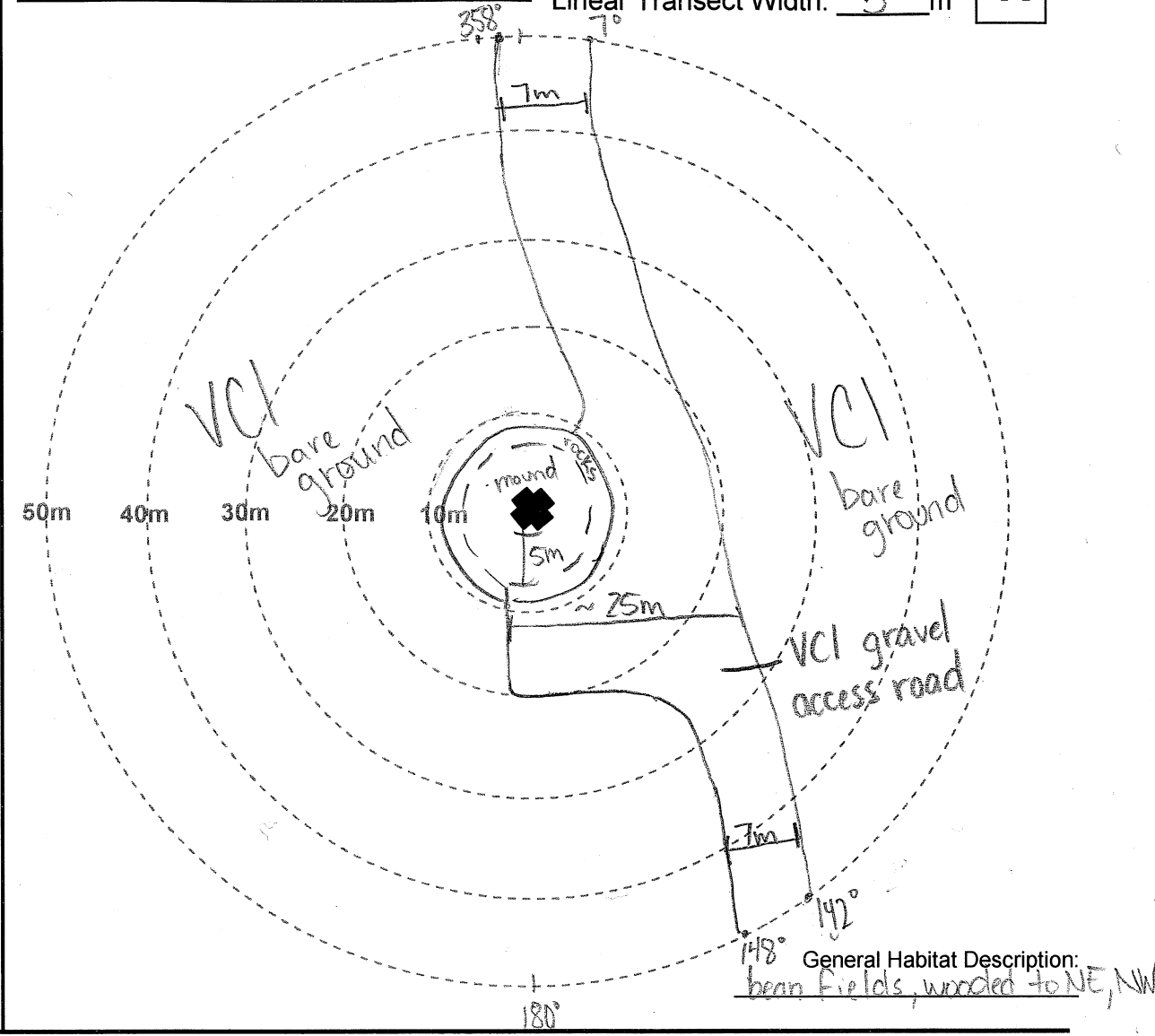
(sketch habitat and visibility classes)

Date (DD/MM/YY): 04 / 08 / 17

Observer: Shelby H. Henry A.

Monthly/Seasonal  
 Linear Transect Width: 5 m

N



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 02

Photo Numbers (from turbine base)  
 Facing North: 2258  
 Facing East: 2259  
 Facing South: 2260  
 Facing West: 2261  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 05/09/17  
 Observer: Shelby H. Henry A  
 Monthly/Seasonal  
 Linear Transect Width: 5 m

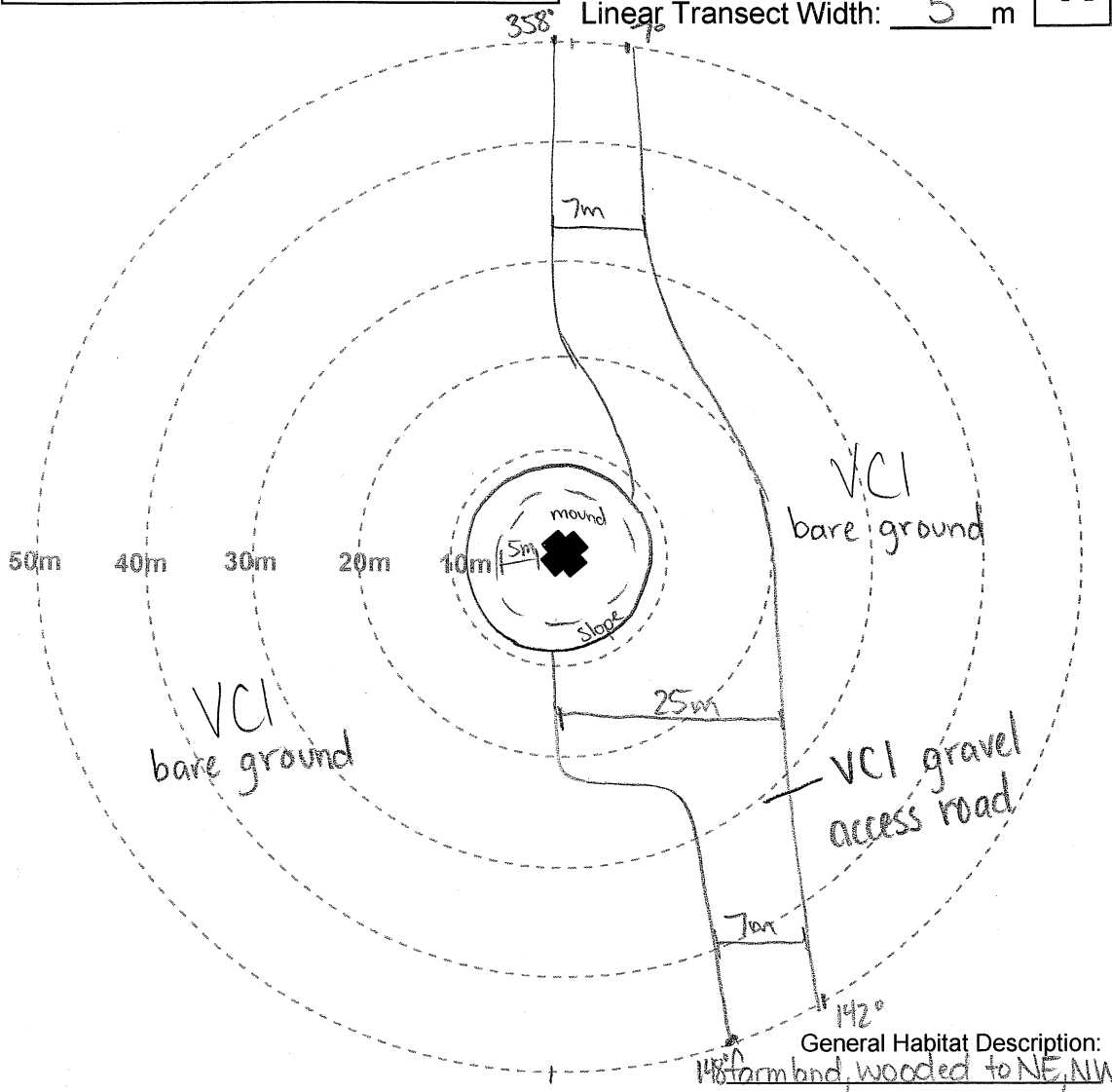
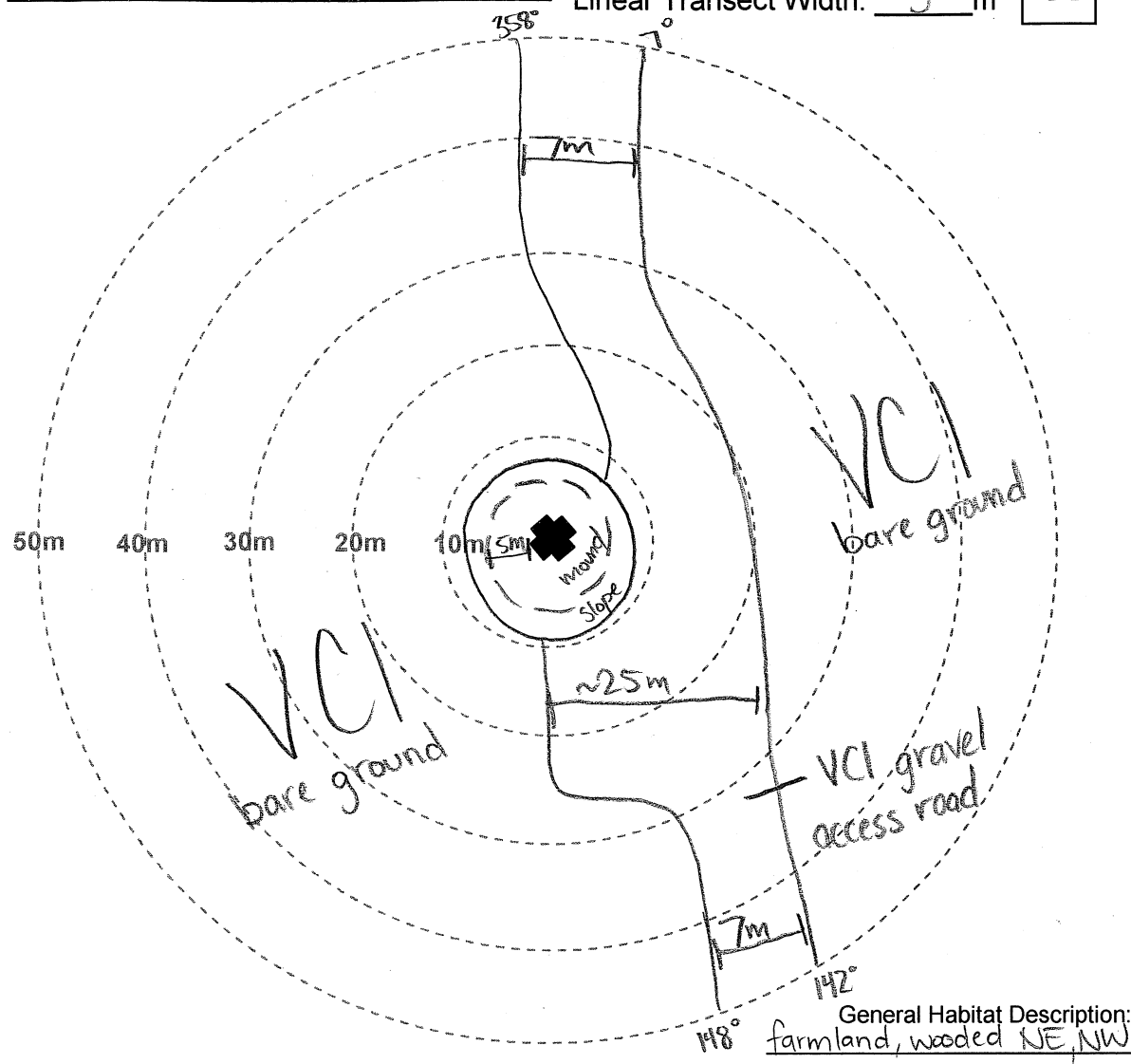


Photo Numbers (from turbine base)  
 Facing North: 2418  
 Facing East: 2419  
 Facing South: 2420  
 Facing West: 2421  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



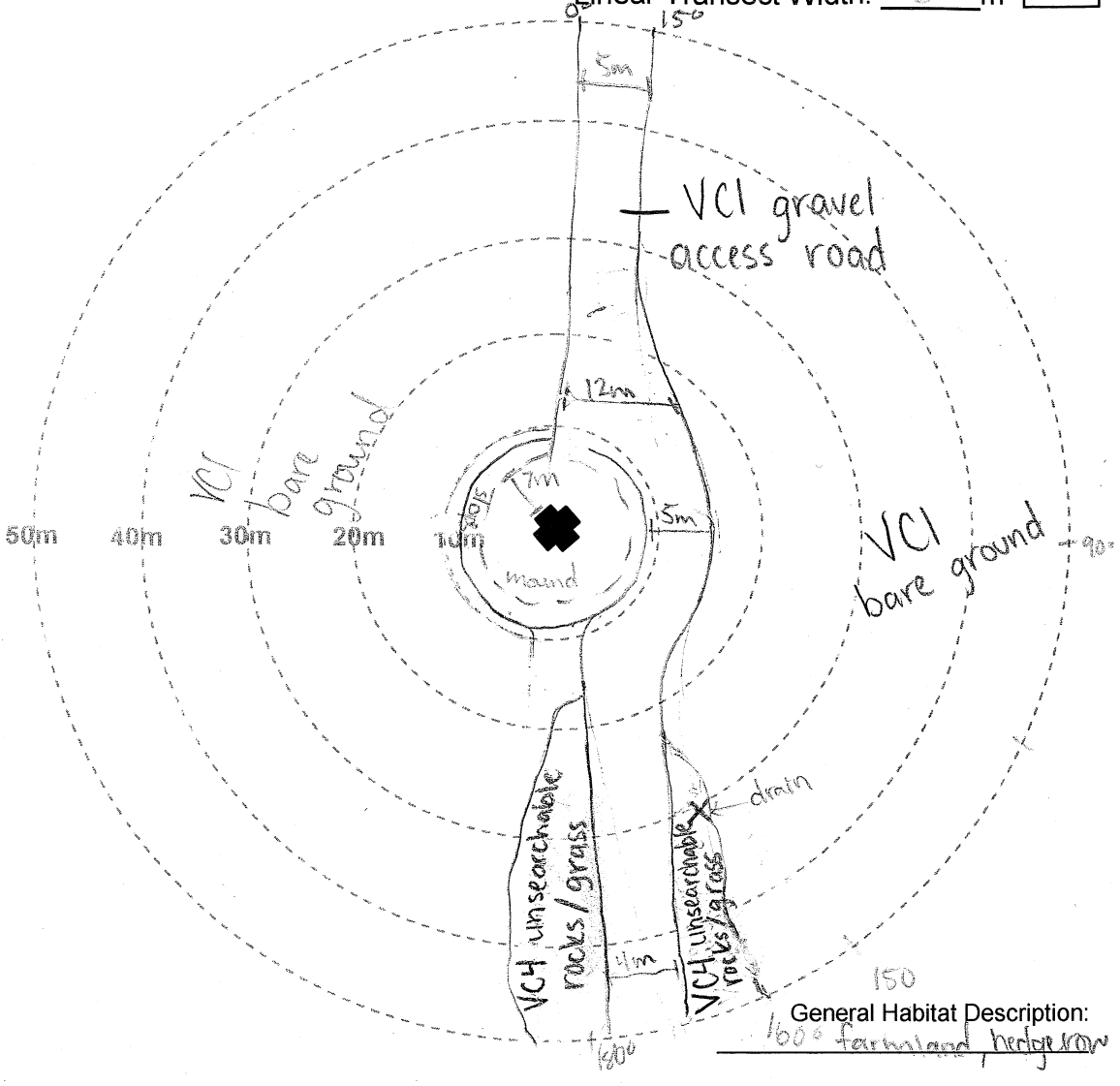
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill Project #: 1875A Turbine #: 3 Degree of Slope 0 degrees Slope Orientation N/A (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 1505  
 Facing East: 1506  
 Facing South: 1507  
 Facing West: 1508  
 (sketch habitat and visibility classes)

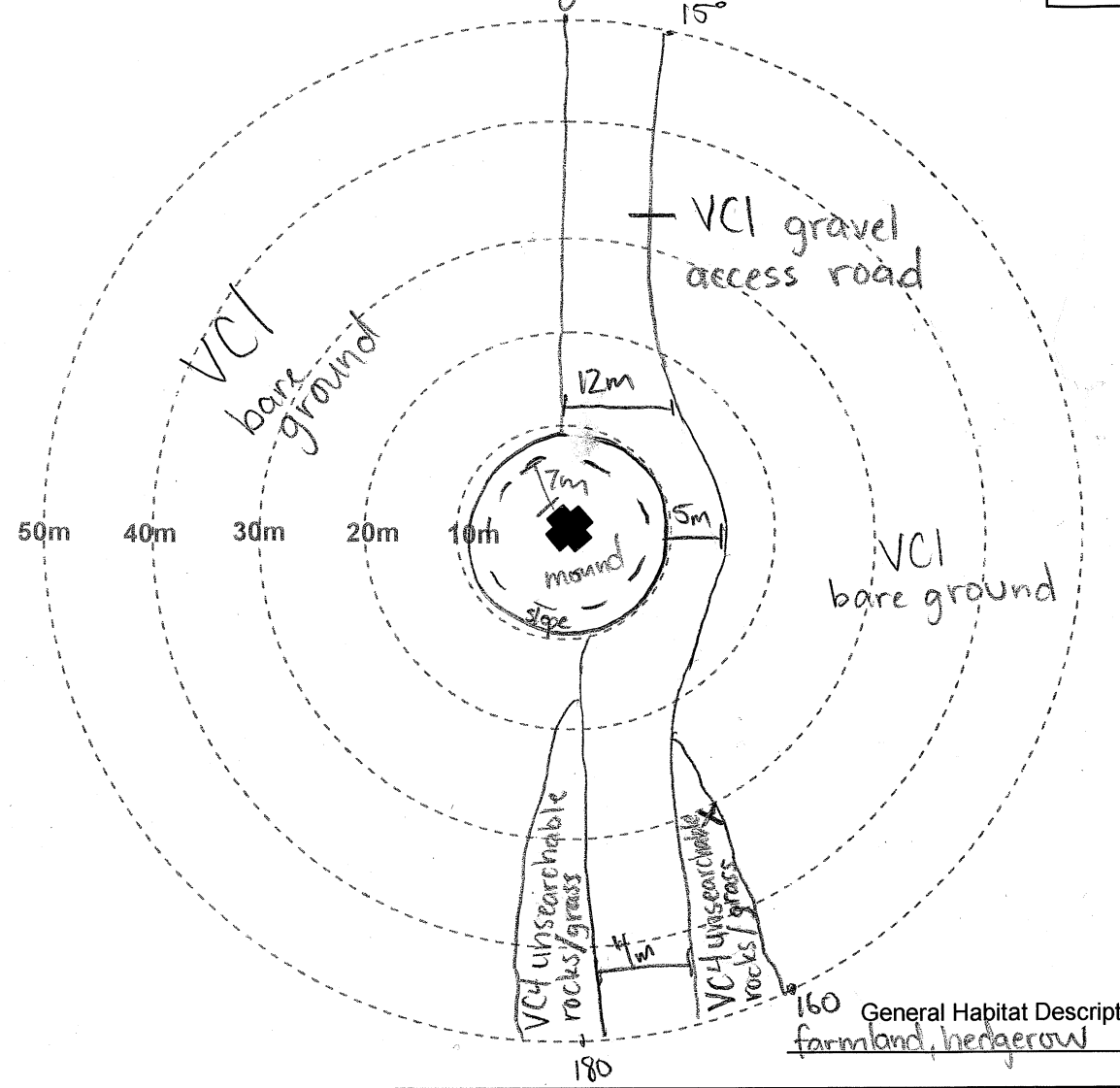
Date (DD/MM/YY): 16/05/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description:  
160° farmland, hedgerow

Photo Numbers (from turbine base)  
 Facing North: 1658  
 Facing East: 1659  
 Facing South: 1660  
 Facing West: 1661  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 09/06/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description:  
180° farmland, hedgerow

VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

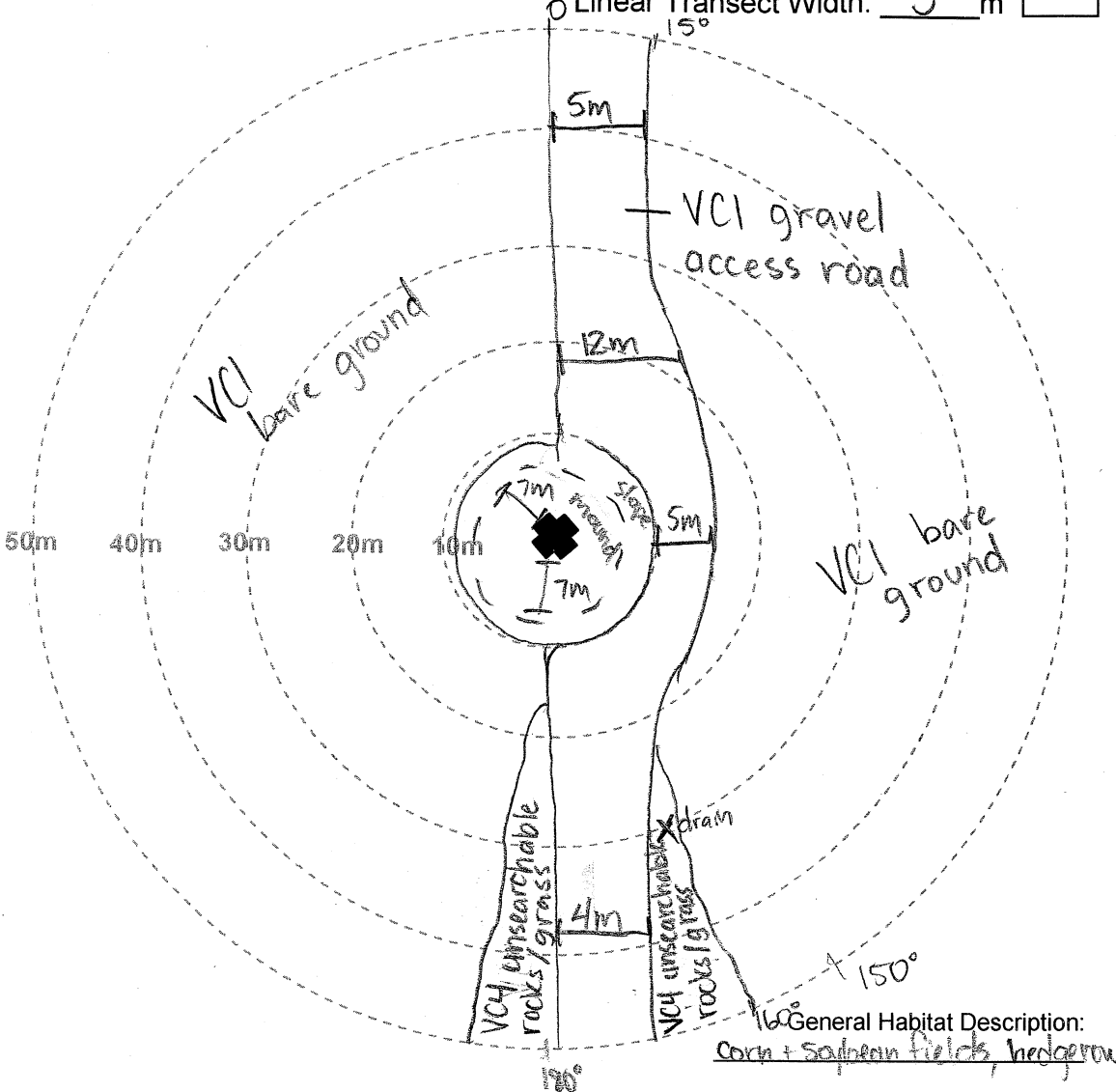
# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 03

Photo Numbers (from turbine base)  
 Facing North: 1766  
 Facing East: 1767  
 Facing South: 1768  
 Facing West: 1770  
 (sketch habitat and visibility classes)

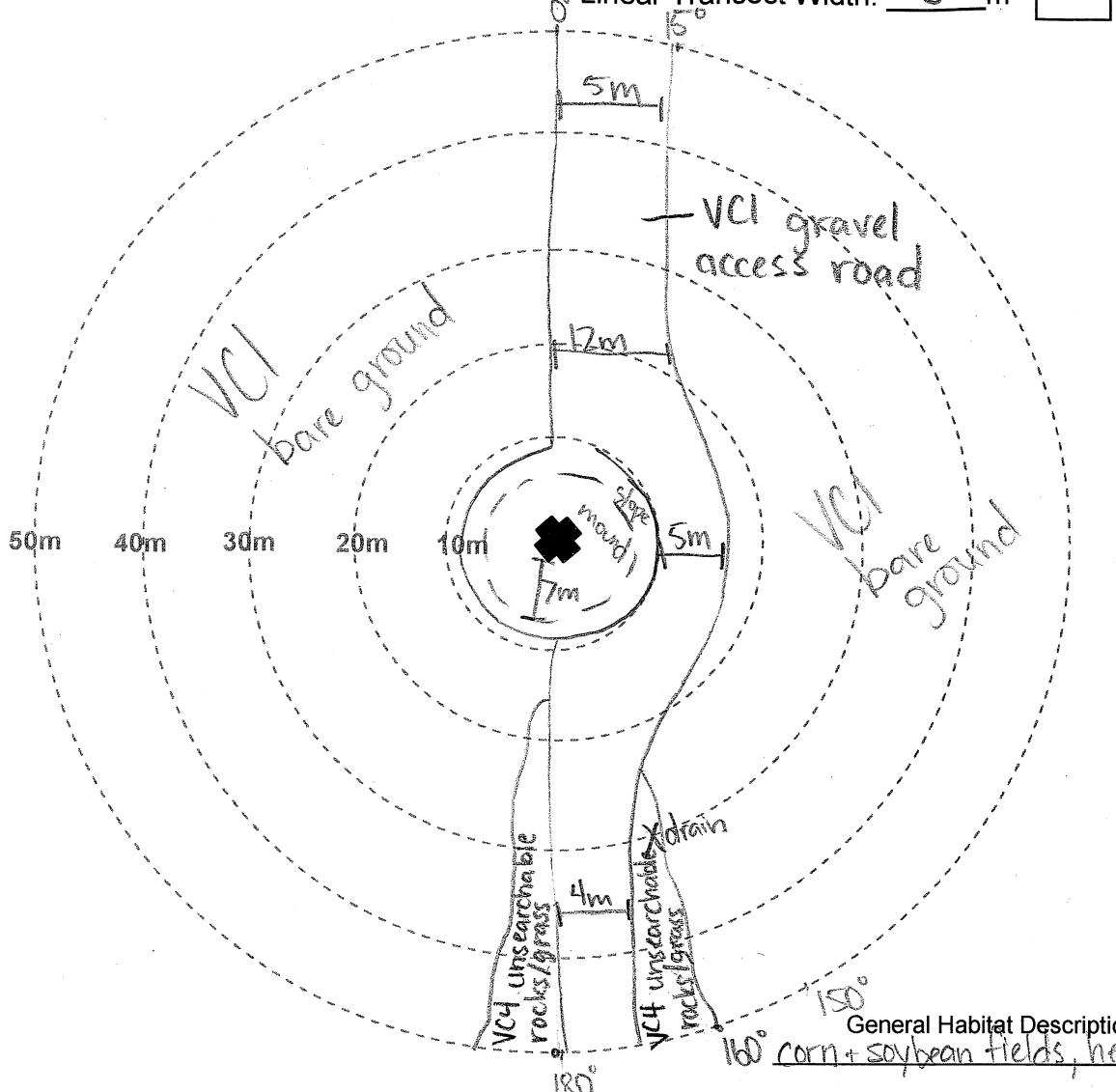
Date (DD/MM/YY): 04/07/17  
 Observer: Shelby H. Henry A  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



General Habitat Description:  
Corn + soybean fields, hedgerow

Photo Numbers (from turbine base)  
 Facing North: 2027  
 Facing East: 2028  
 Facing South: 2029  
 Facing West: 2030  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04/08/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



General Habitat Description:  
Corn + soybean fields, hedgerow

VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 03

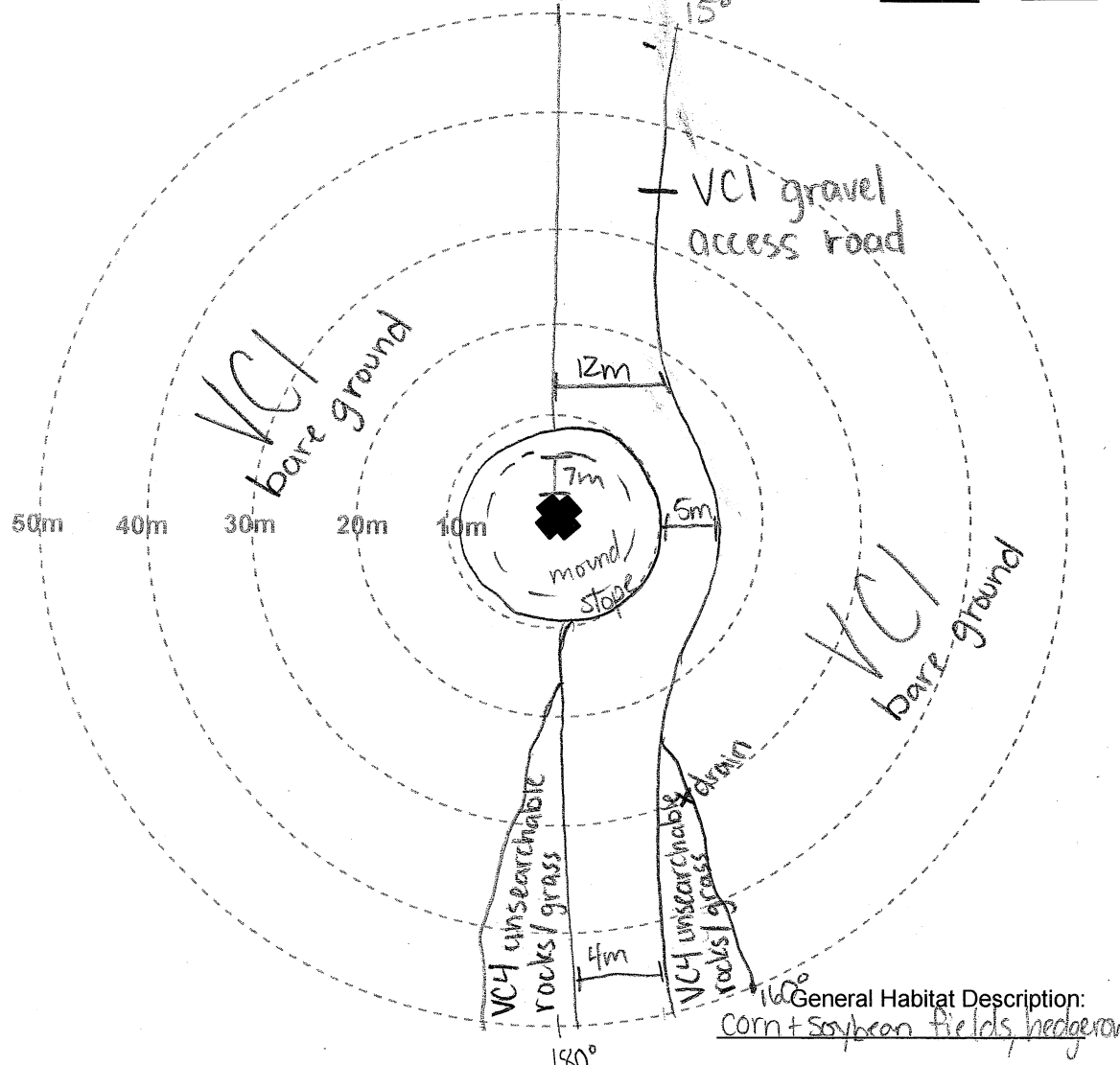
Photo Numbers (from turbine base)  
 Facing North: 2306  
 Facing East: 2307  
 Facing South: 2308  
 Facing West: 2309  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 12/09/17

Observer: Shelby H. Henry A

Monthly/Seasonal Linear Transect Width: 5 m

↑  
N



General Habitat Description:  
Corn + Soybean fields, hedgerow

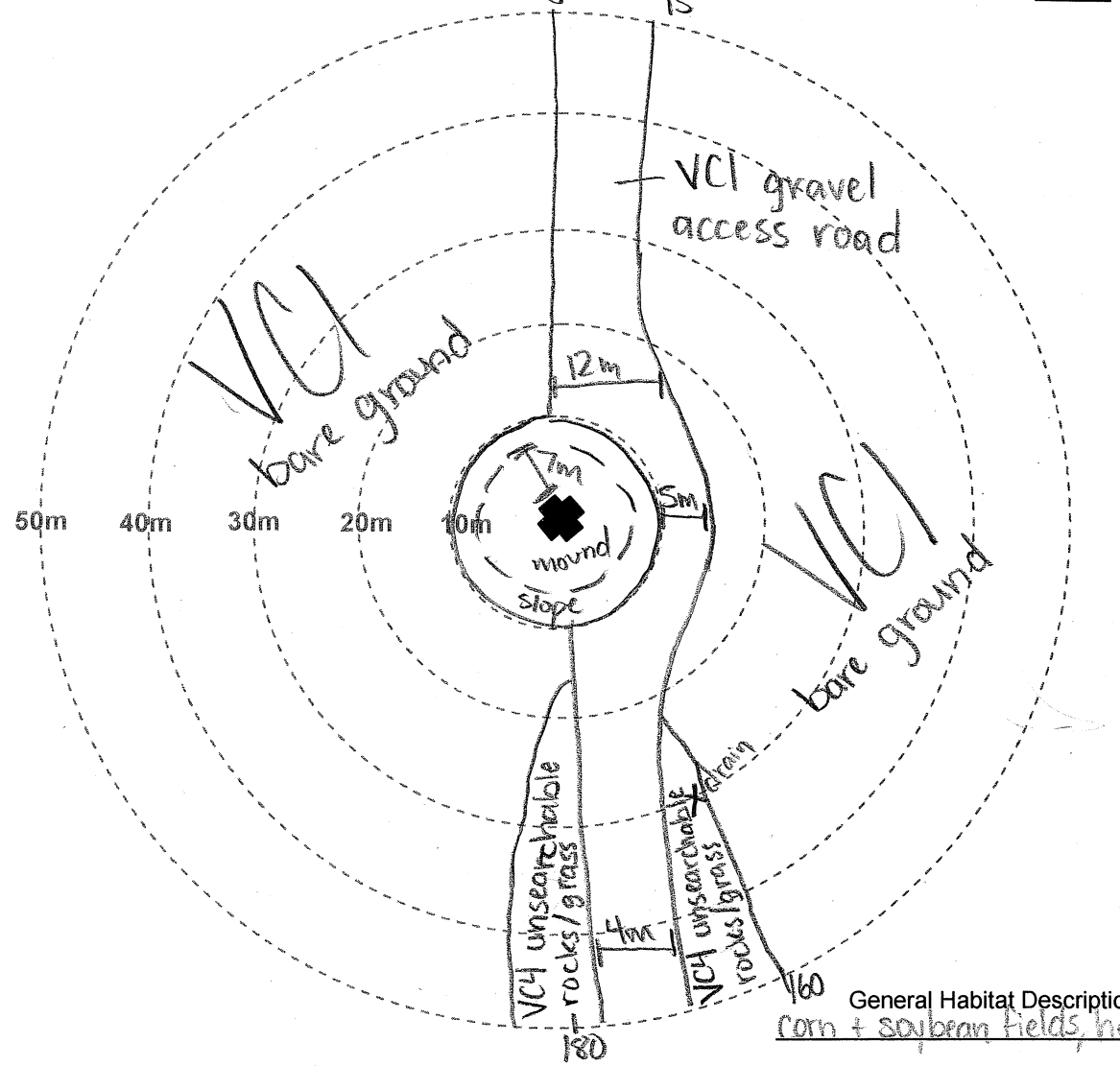
Photo Numbers (from turbine base)  
 Facing North: 2422  
 Facing East: 2423  
 Facing South: 2424  
 Facing West: 2425  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/17

Observer: Shelby H. Henry A.

Monthly/Seasonal Linear Transect Width: 5 m

↑  
N



General Habitat Description:  
Corn + Soybean fields, hedgerow

VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats



# Visibility Class Map

Project Name: Gunn's Hill Project #: 1875A Turbine #: 4 Degree of Slope 2 degrees Slope Orientation SE (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 1428  
 Facing East: 1430  
 Facing South: 1431  
 Facing West: 1432  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 09/05/17

Observer: Shelby H., Henry A.

Monthly/Seasonal  
 Linear Transect Width: 5 m

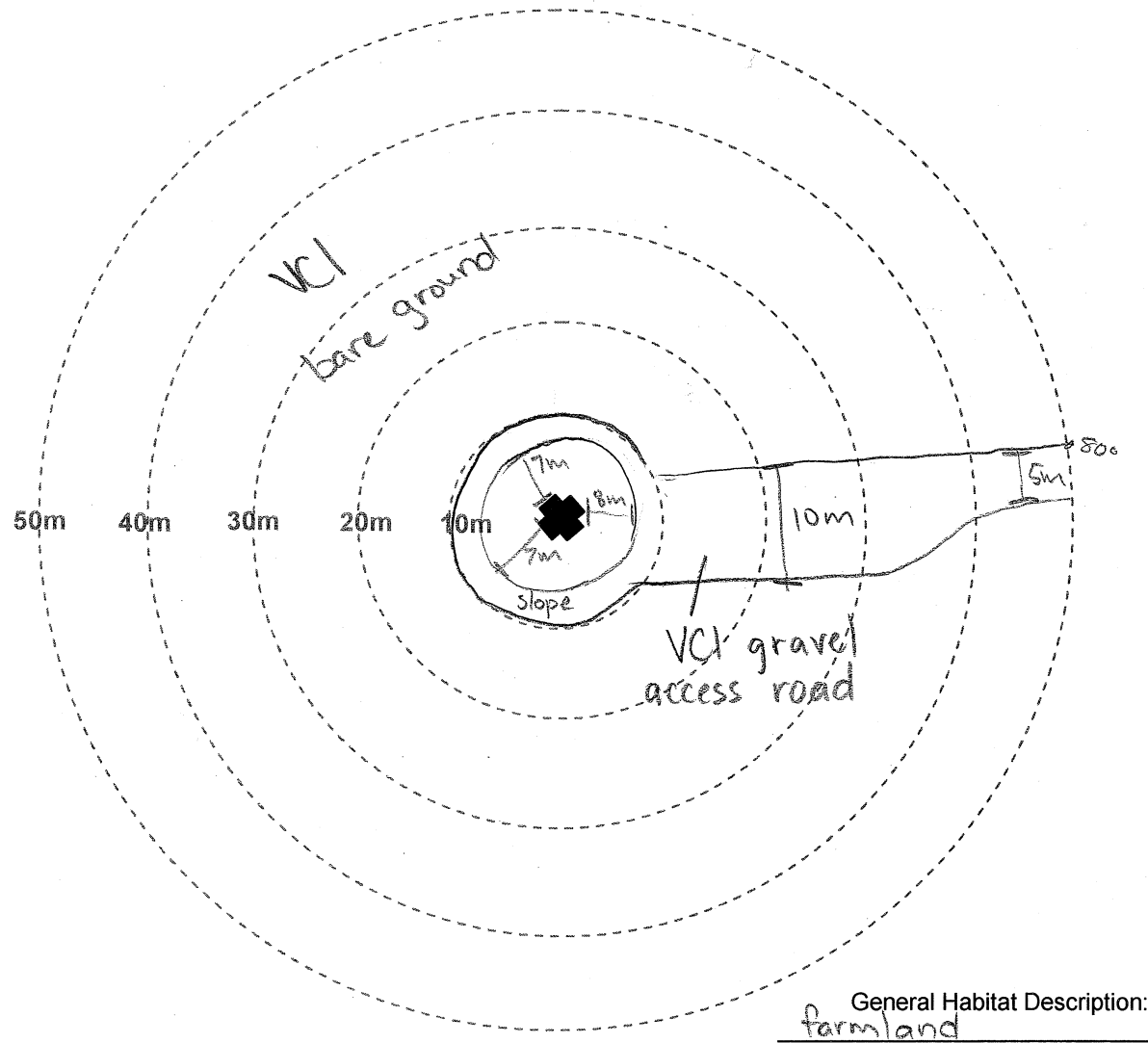
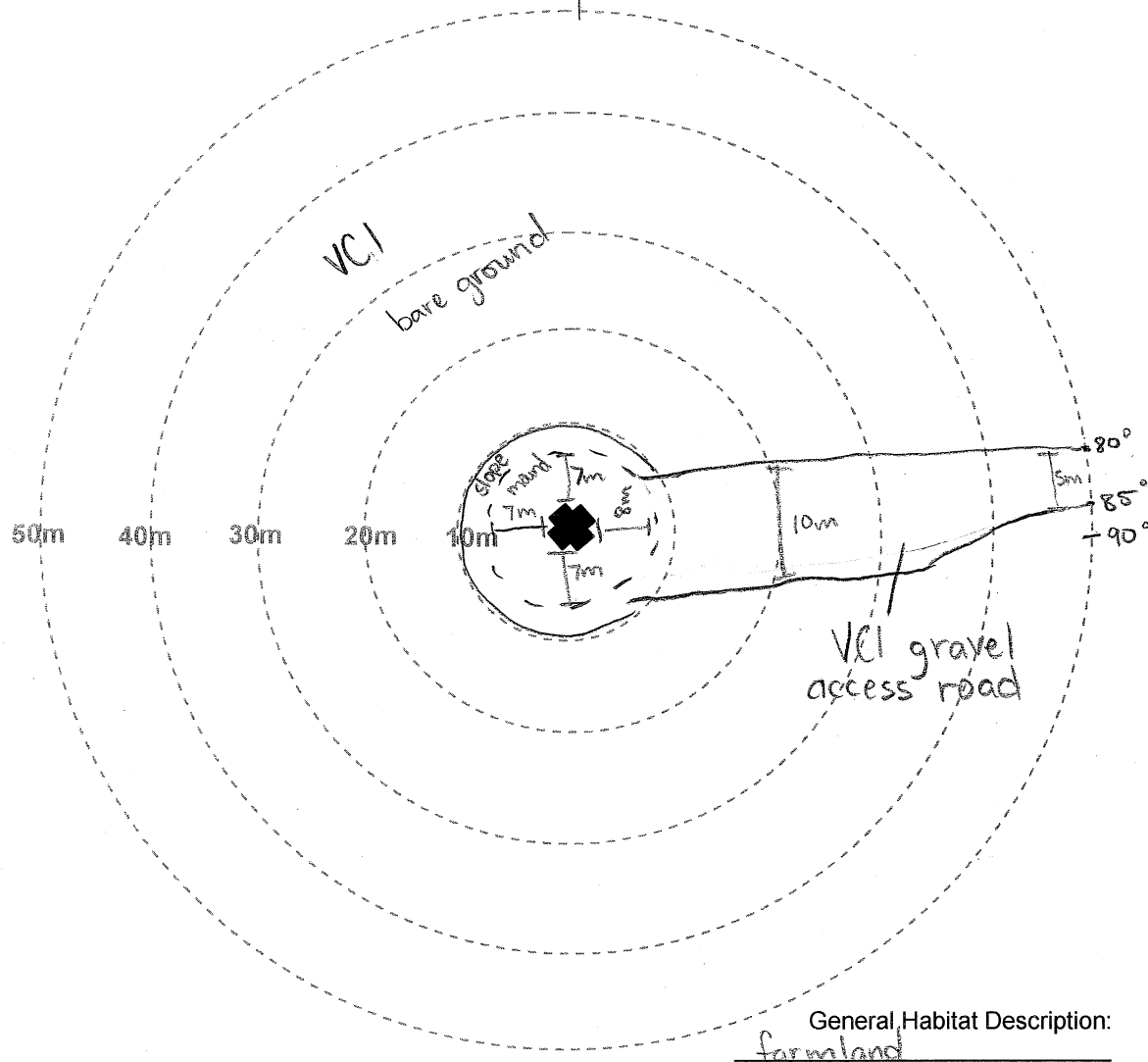


Photo Numbers (from turbine base)  
 Facing North: 1573  
 Facing East: 1574  
 Facing South: 1575  
 Facing West: 1576  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/06/17

Observer: Shelby H. Karl H.

Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 04

Photo Numbers (from turbine base)

Facing North: 1861

Facing East: 1862

Facing South: 1863

Facing West: 1864

(sketch habitat and visibility classes)

Date (DD/MM/YY): 11 / 07 / 17

Observer: Shelby H. Henry A.

Monthly/Seasonal  
Linear Transect Width: 5 m



Photo Numbers (from turbine base)

Facing North: 2032

Facing East: 2033

Facing South: 2034

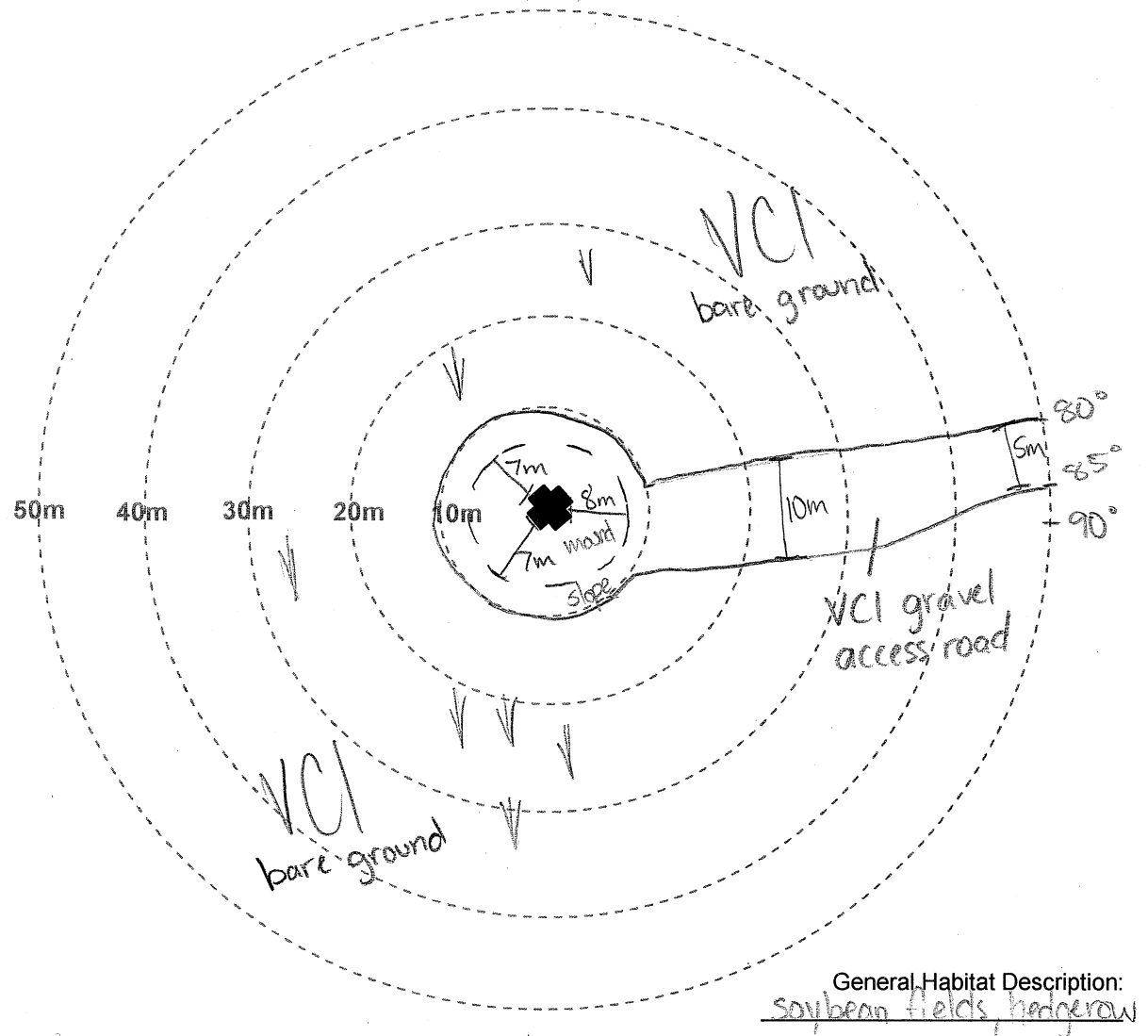
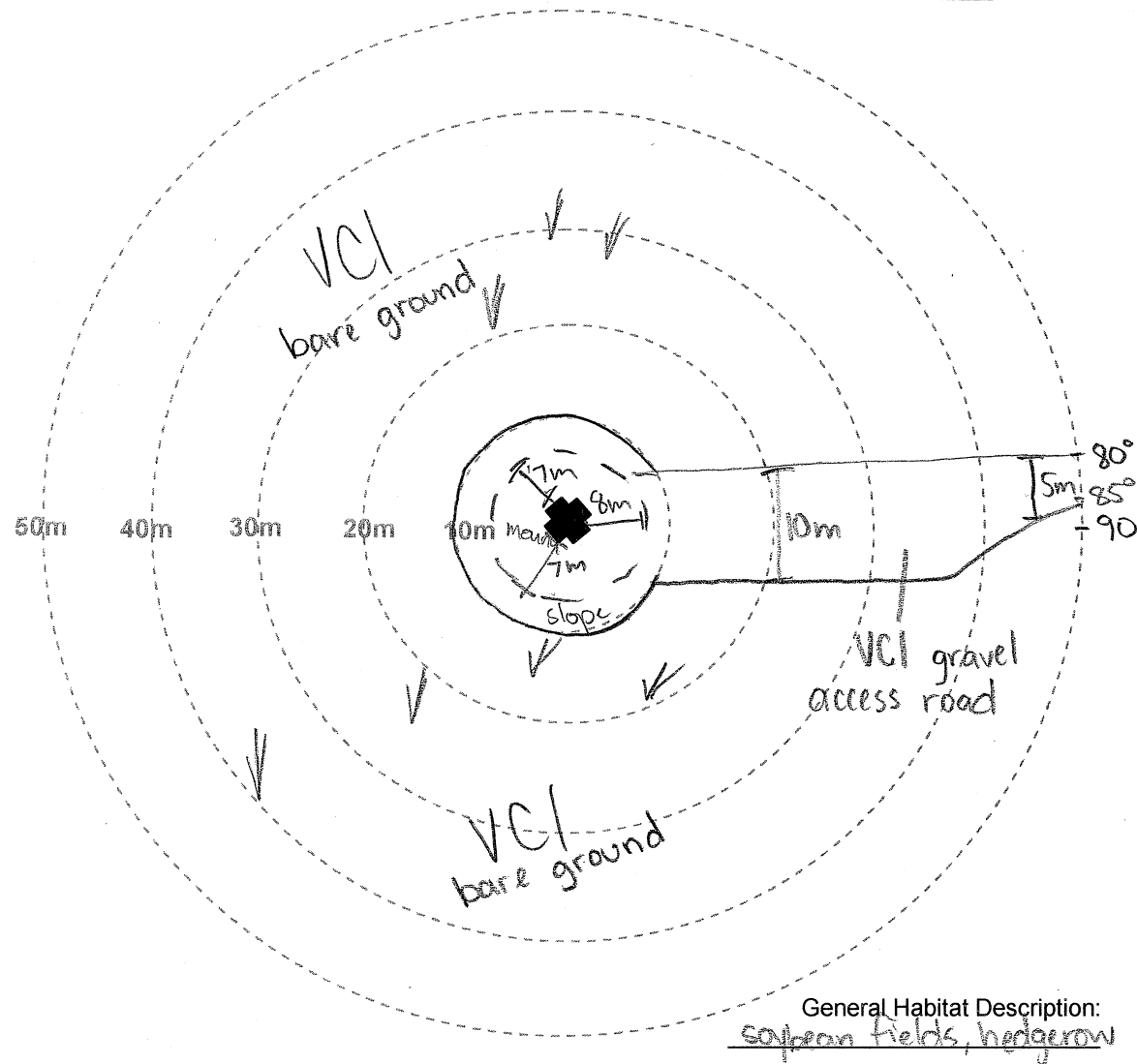
Facing West: 2035

(sketch habitat and visibility classes)

Date (DD/MM/YY): 04 / 08 / 17

Observer: Shelby H. Henry A.

Monthly/Seasonal  
Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 04

Photo Numbers (from turbine base)

Facing North: 2268  
 Facing East: 2269  
 Facing South: 2270  
 Facing West: 2271

(sketch habitat and visibility classes)

Date (DD/MM/YY): 05/09/17

Observer: Shelby H., Henry A.

Monthly/Seasonal  
 Linear Transect Width: 5 m

N

Photo Numbers (from turbine base)

Facing North: 2429  
 Facing East: 2430  
 Facing South: 2431  
 Facing West: 2432

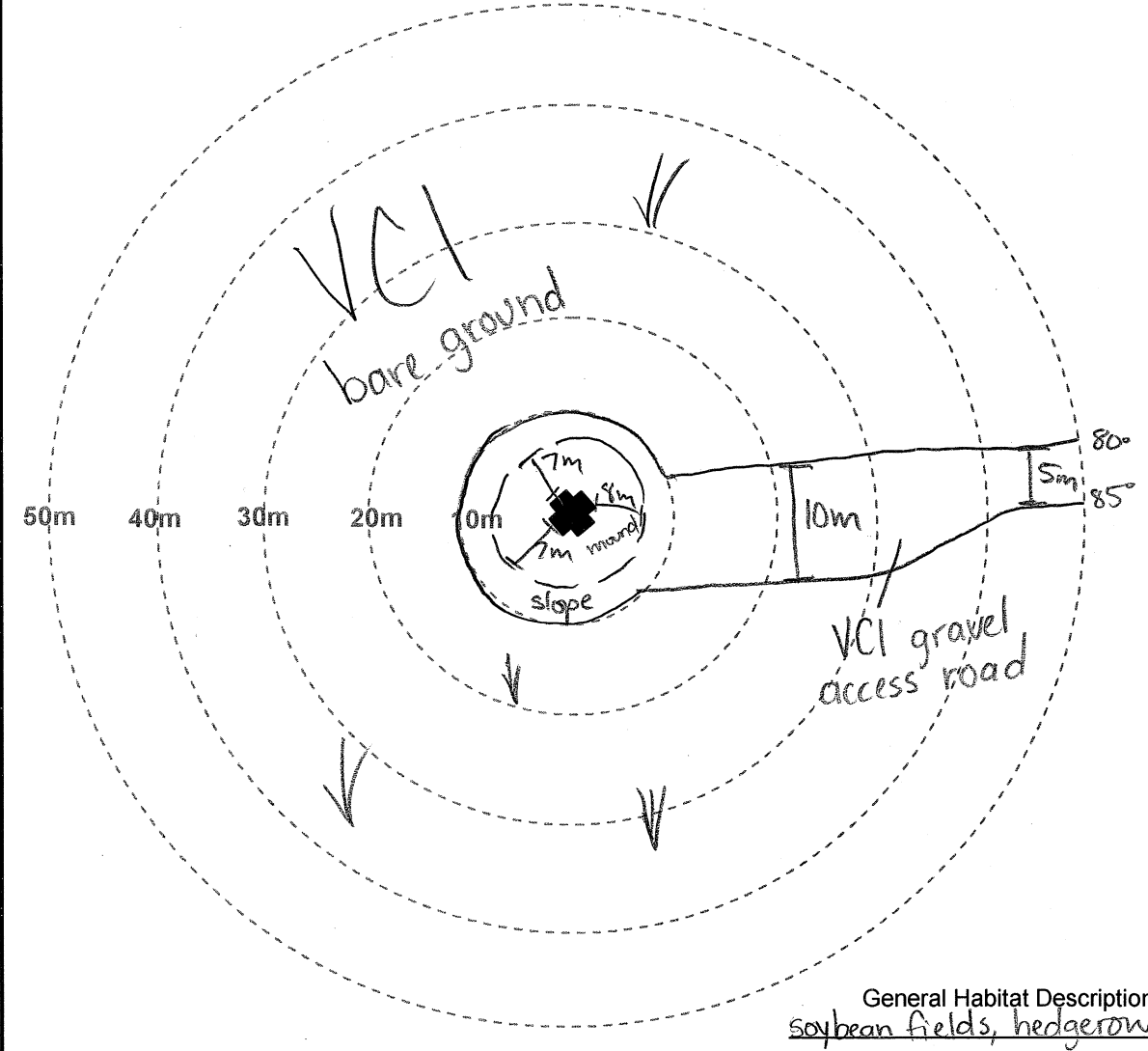
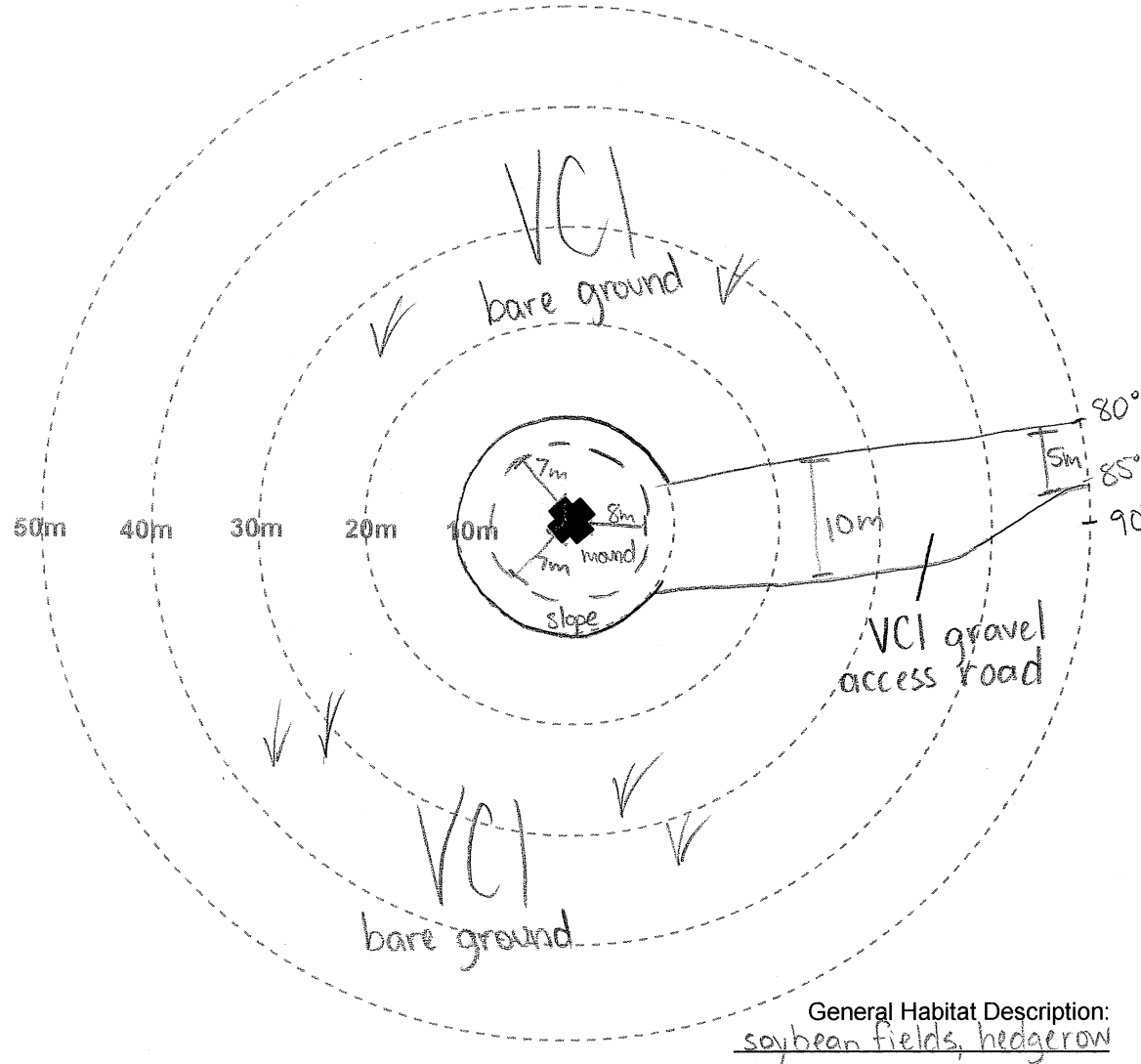
(sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/17

Observer: Shelby H., Henry A.

Monthly/Seasonal  
 Linear Transect Width: 5 m

N



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunnis Hill Project #: 1875A Turbine #: S Degree of Slope 2 degrees Slope Orientation S (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 1414  
 Facing East: 1415  
 Facing South: 1416  
 Facing West: 1417  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 05/05/17

Observer: Shelby H.

Monthly/Seasonal  
 Linear Transect Width: 5 m

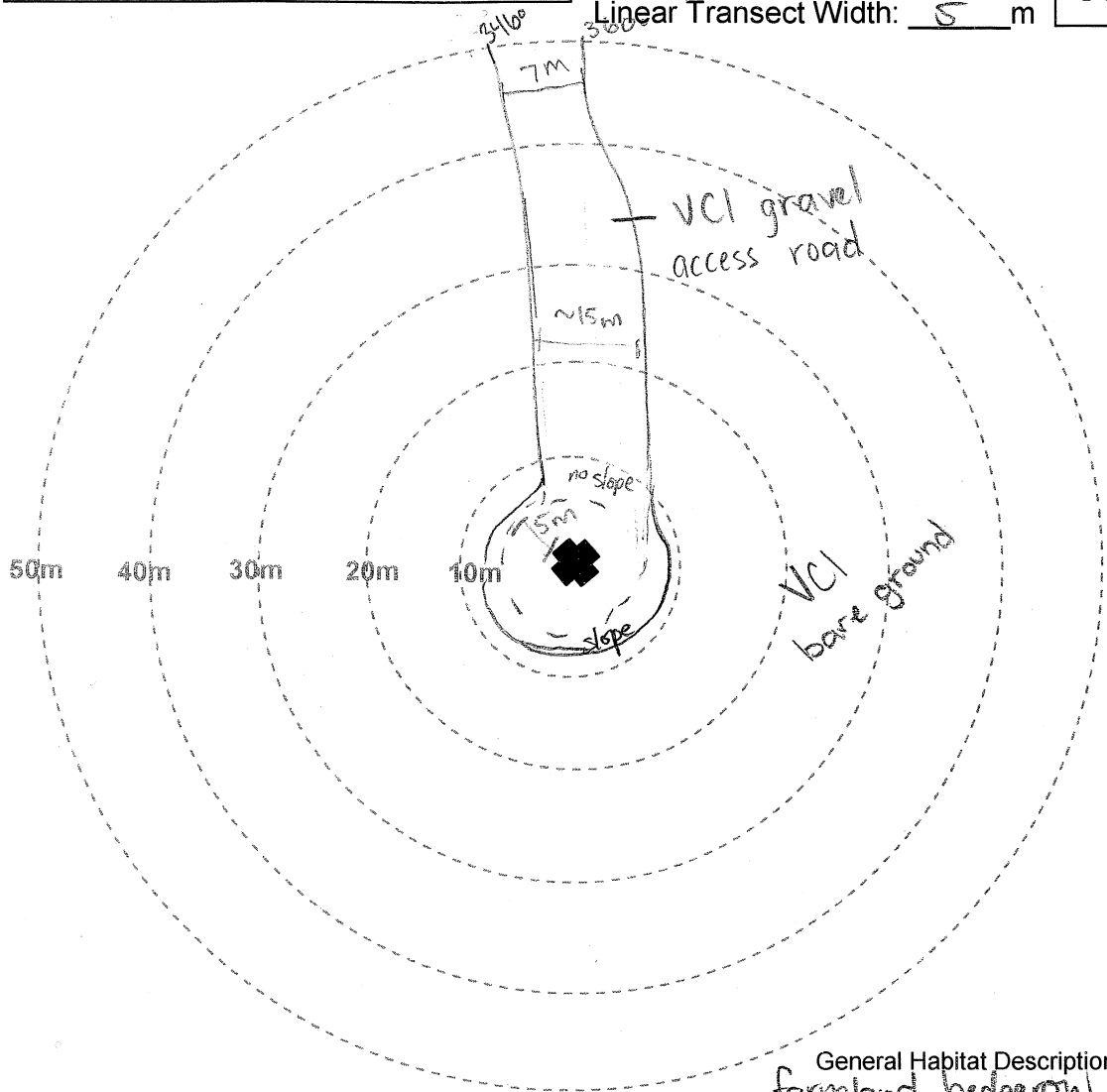
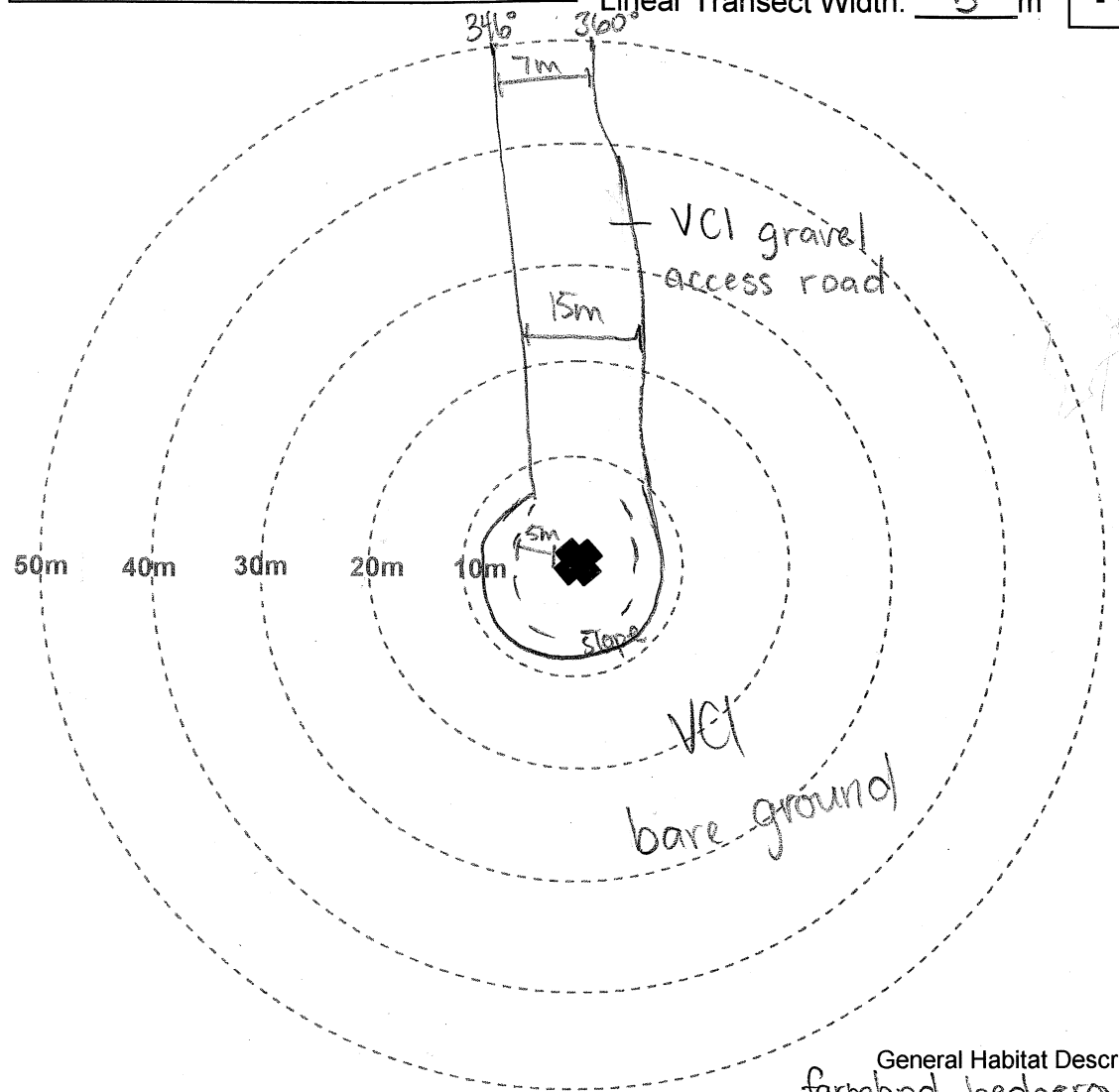


Photo Numbers (from turbine base)  
 Facing North: 1616  
 Facing East: 1617  
 Facing South: 1618  
 Facing West: 1619  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 06/06/17

Observer: Shelby H. Henry A

Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 05

Photo Numbers (from turbine base)

Facing North: 1772

Facing East: 1773

Facing South: 1774

Facing West: 1775

(sketch habitat and visibility classes)

Date (DD/MM/YY): 01/07/14

Observer: Shelby H. Henry A

Monthly/Seasonal  
Linear Transect Width: 5 m

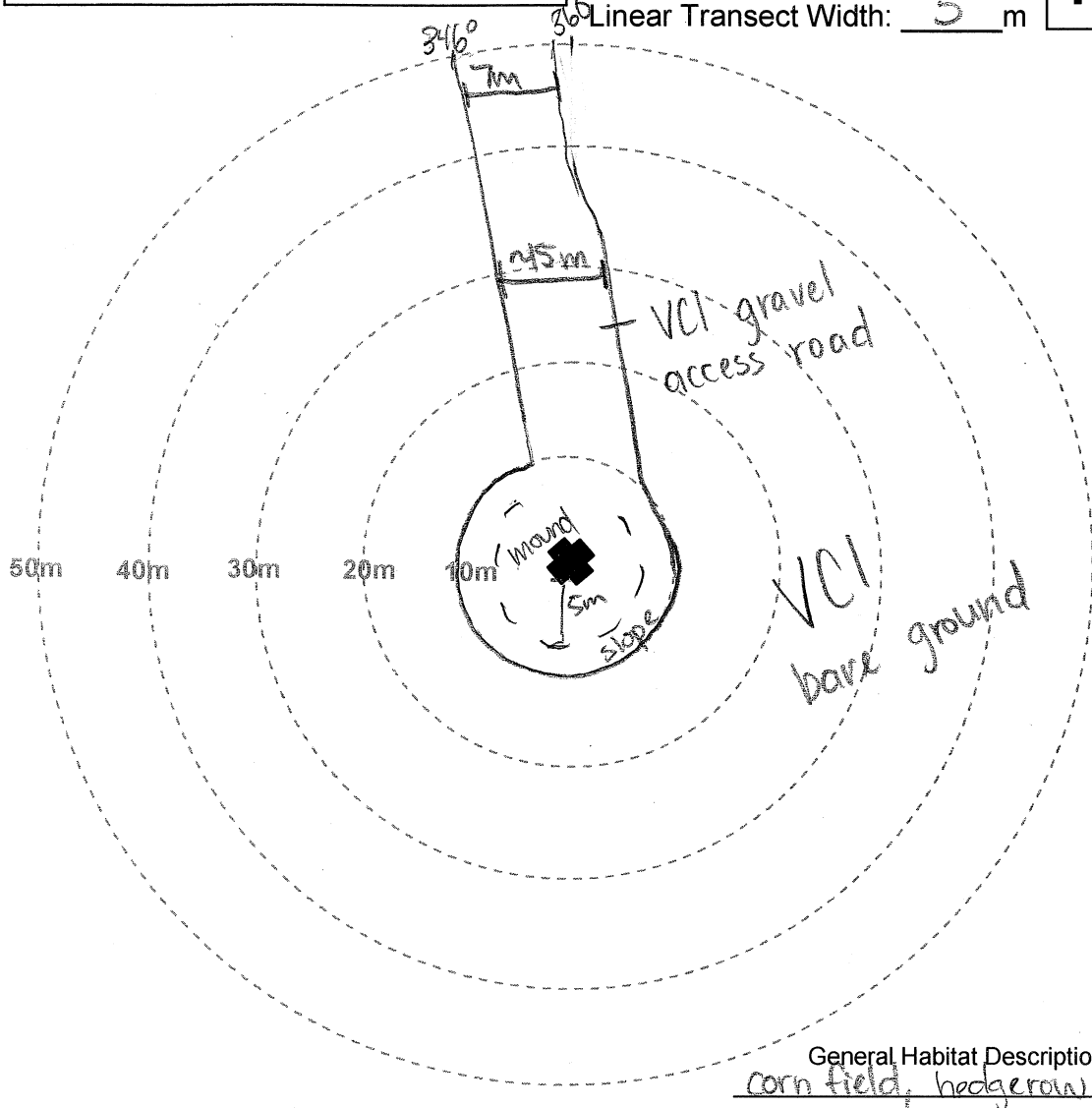


Photo Numbers (from turbine base)

Facing North: 2036

Facing East: 2037

Facing South: 2038

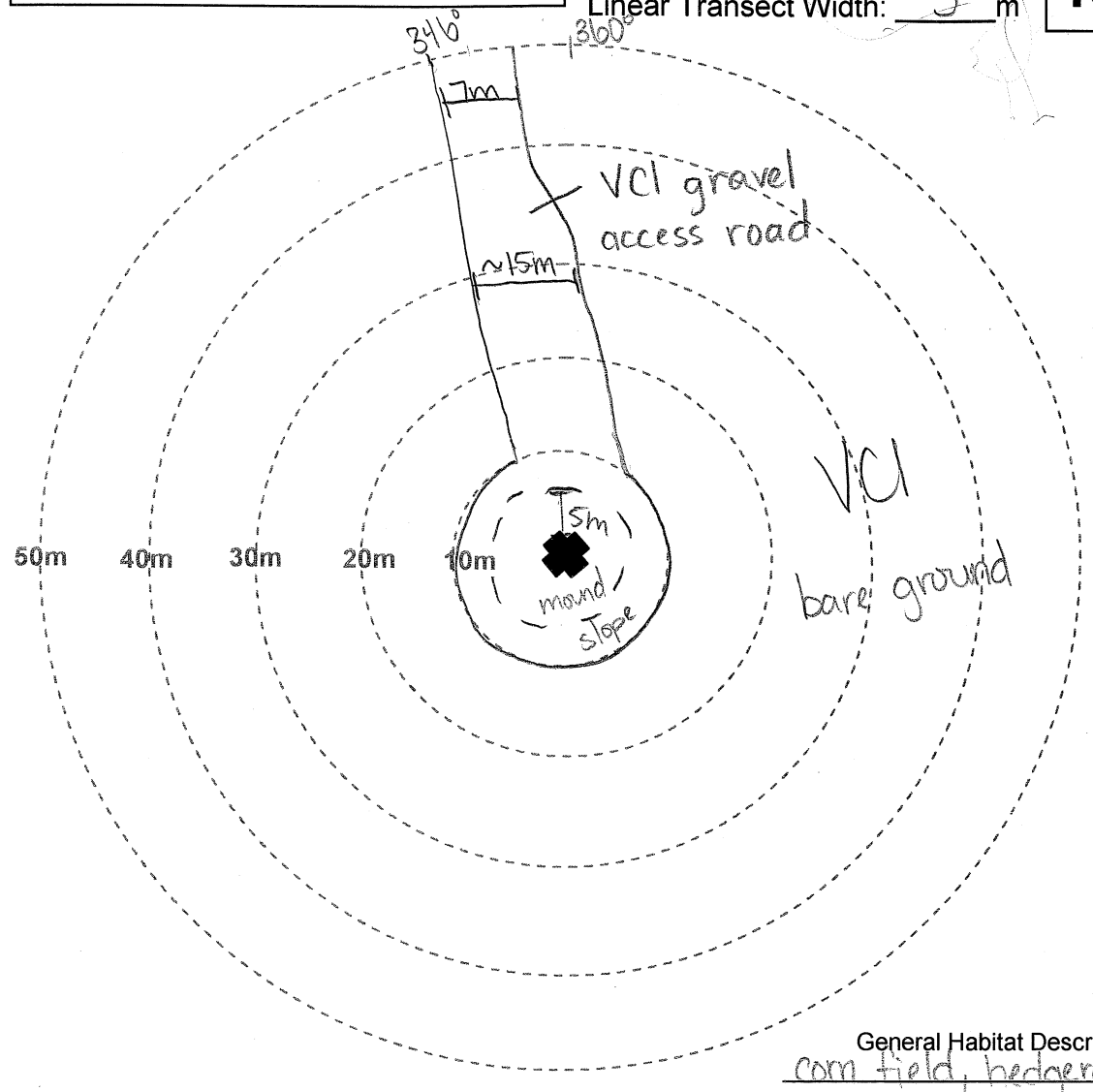
Facing West: 2039

(sketch habitat and visibility classes)

Date (DD/MM/YY): 01/08/17

Observer: Shelby H. Henry A.

Monthly/Seasonal  
Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

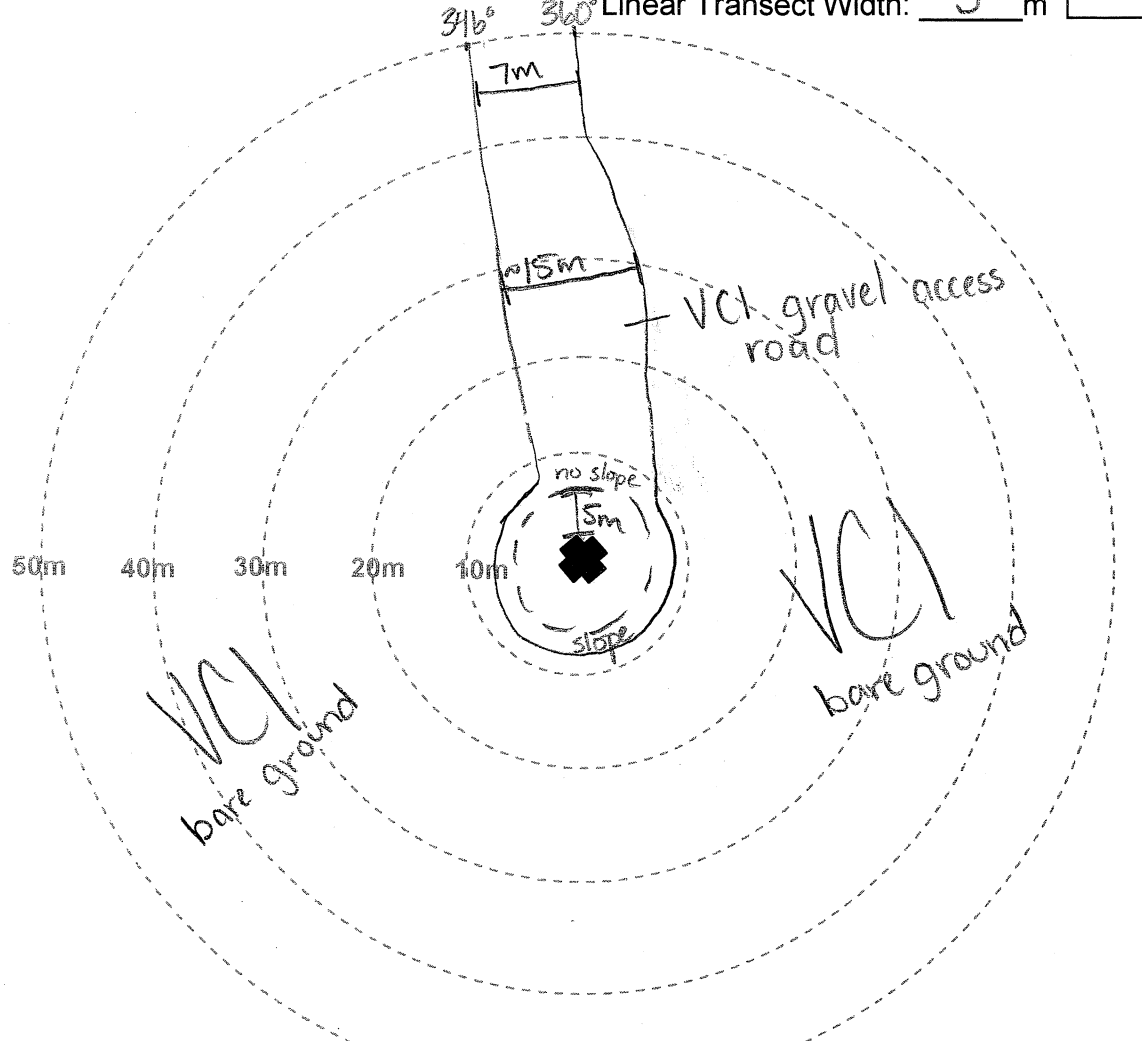
# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 05

Photo Numbers (from turbine base)  
 Facing North: 2318  
 Facing East: 2319  
 Facing South: 2320  
 Facing West: 2321  
 (sketch habitat and visibility classes)

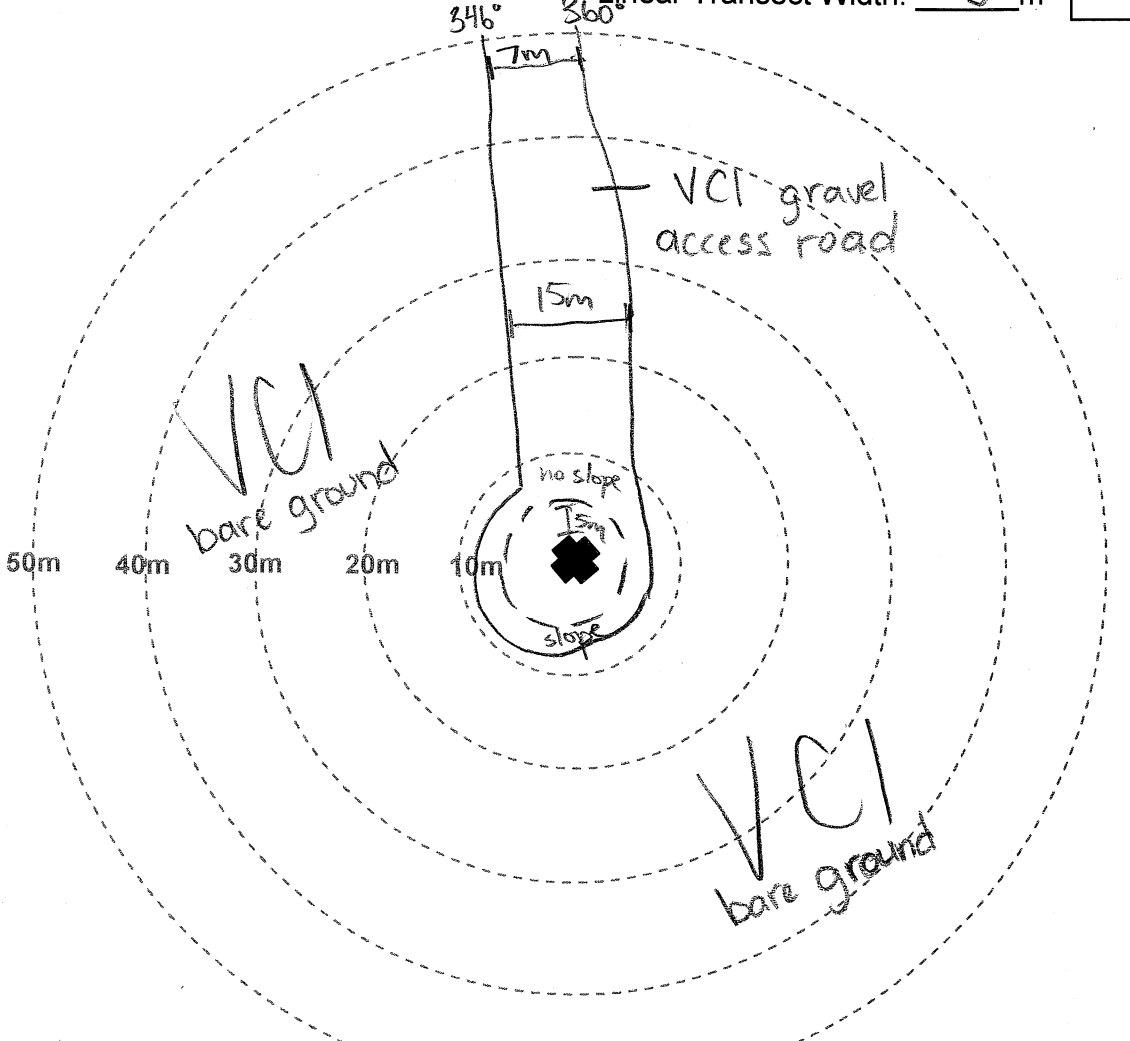
Date (DD/MM/YY): 12/09/17  
 Observer: Shelby H., Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



General Habitat Description:  
corn field, hedgerow

Photo Numbers (from turbine base)  
 Facing North: 2434  
 Facing East: 2435  
 Facing South: 2436  
 Facing West: 2437  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



General Habitat Description:  
corn field, hedgerow

VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunnis Hill Project #: 1875A Turbine #: 0 Degree of Slope 2 degrees Slope Orientation NE (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 1478  
 Facing East: 1479  
 Facing South: 1480  
 Facing West: 1481  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 12/05/17  
 Observer: Shelby H. Karl  
 Monthly/Seasonal  
 Linear Transect Width: 5 m

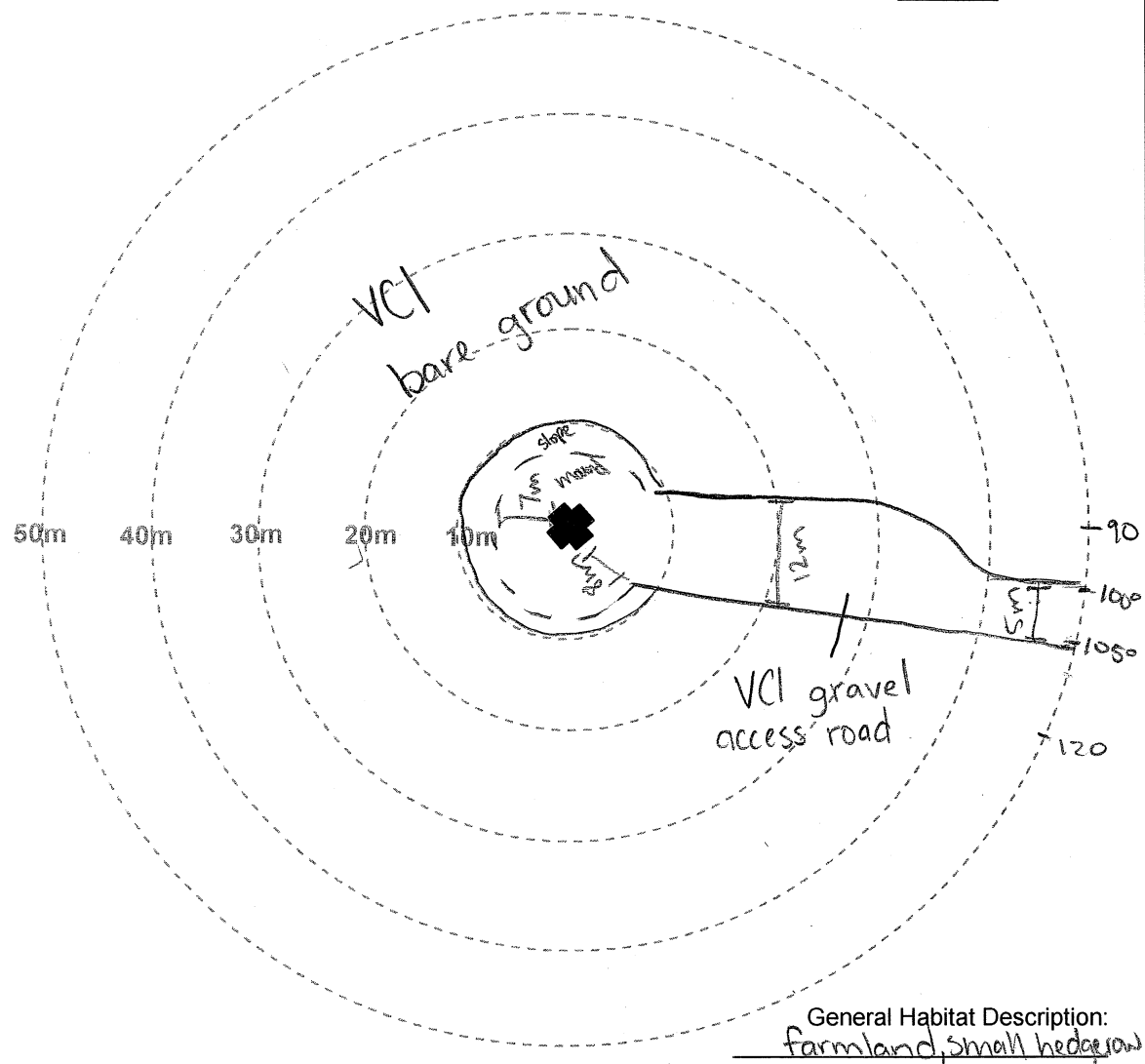
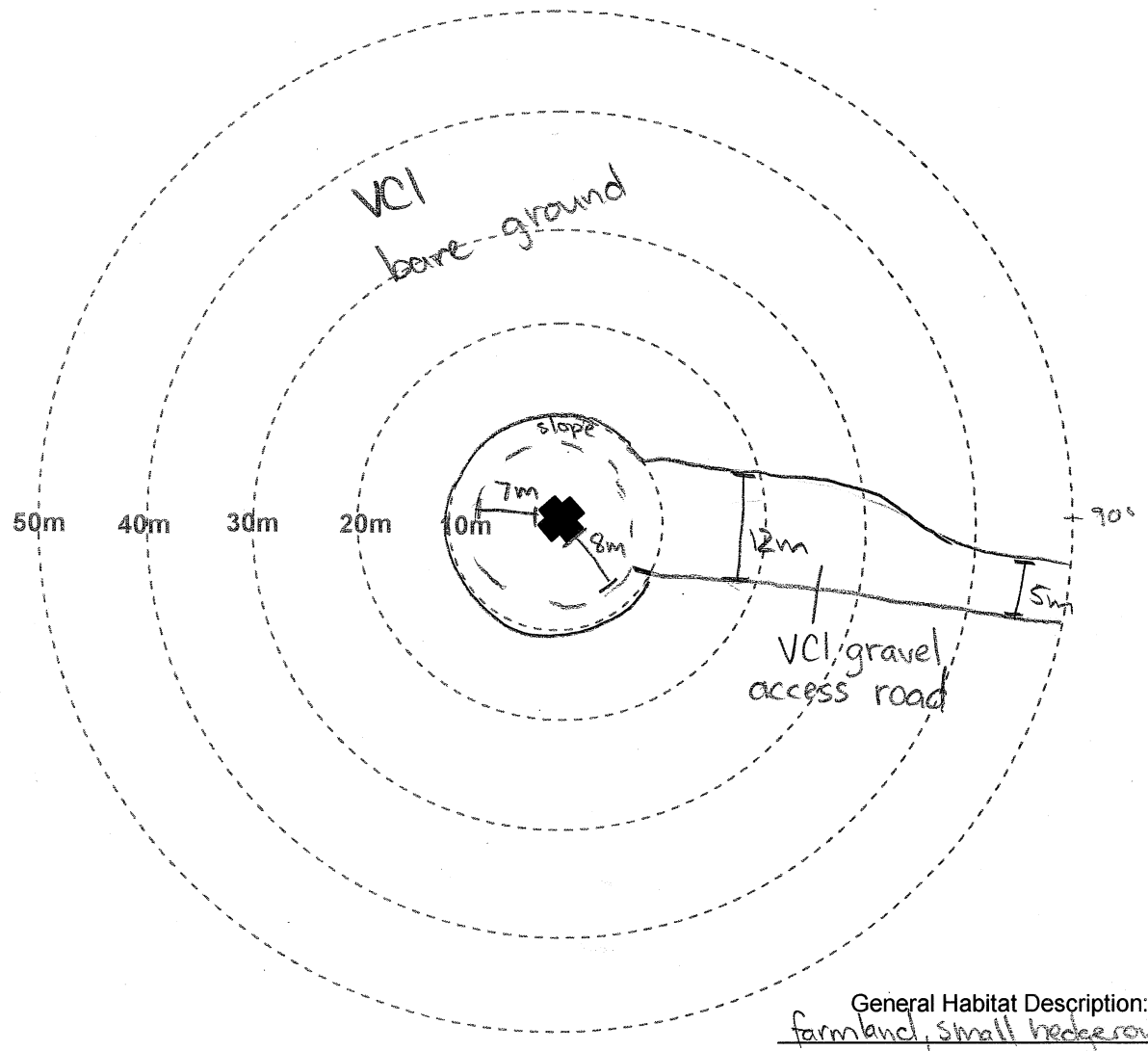


Photo Numbers (from turbine base)  
 Facing North: 1578  
 Facing East: 1579  
 Facing South: 1580  
 Facing West: 1581  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/06/17  
 Observer: Shelby H. Karl H  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



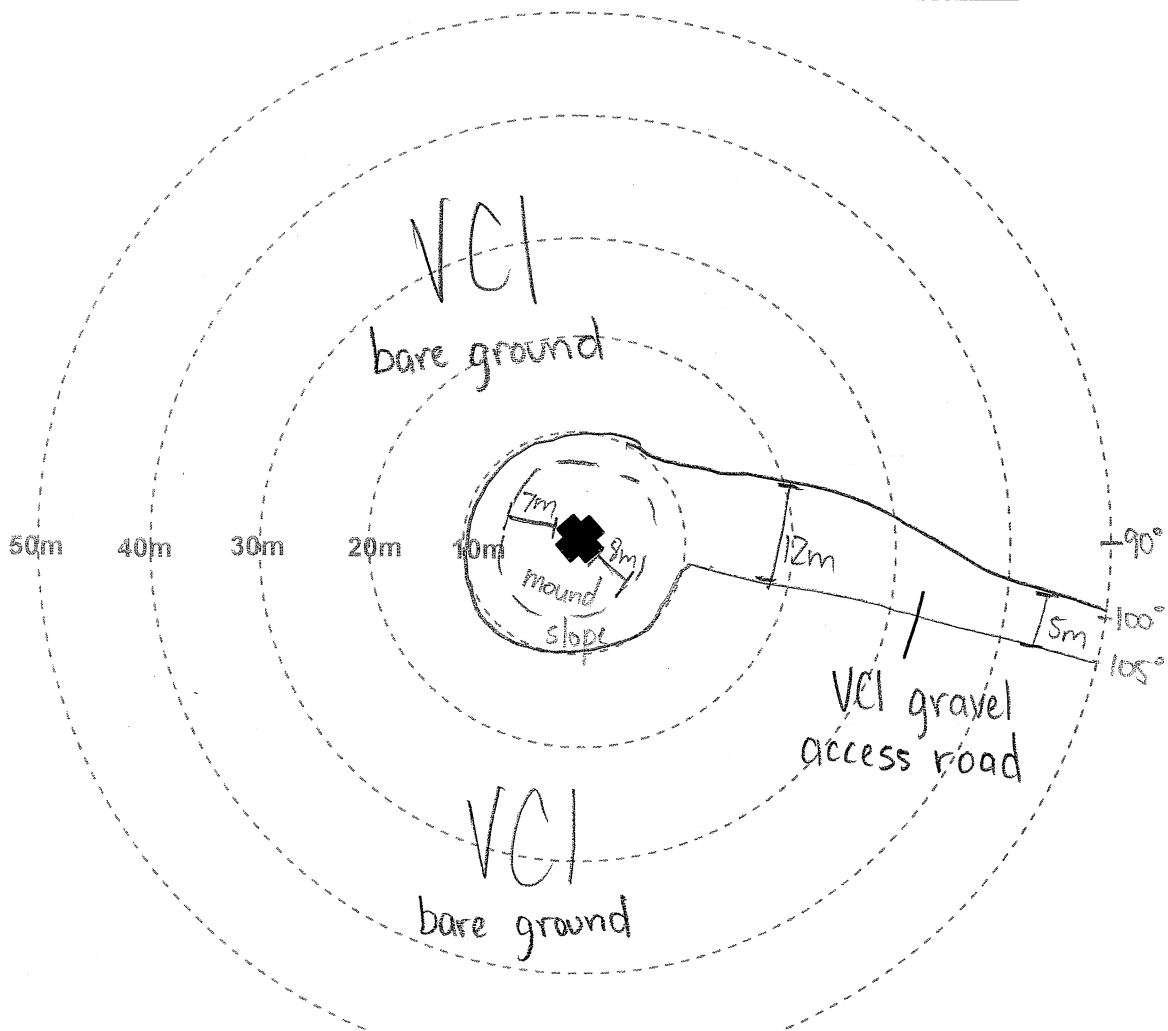
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill Project #: 1875A Turbine #: 06

Photo Numbers (from turbine base)  
 Facing North: 1866  
 Facing East: 1867  
 Facing South: 1868  
 Facing West: 1869  
 (sketch habitat and visibility classes)

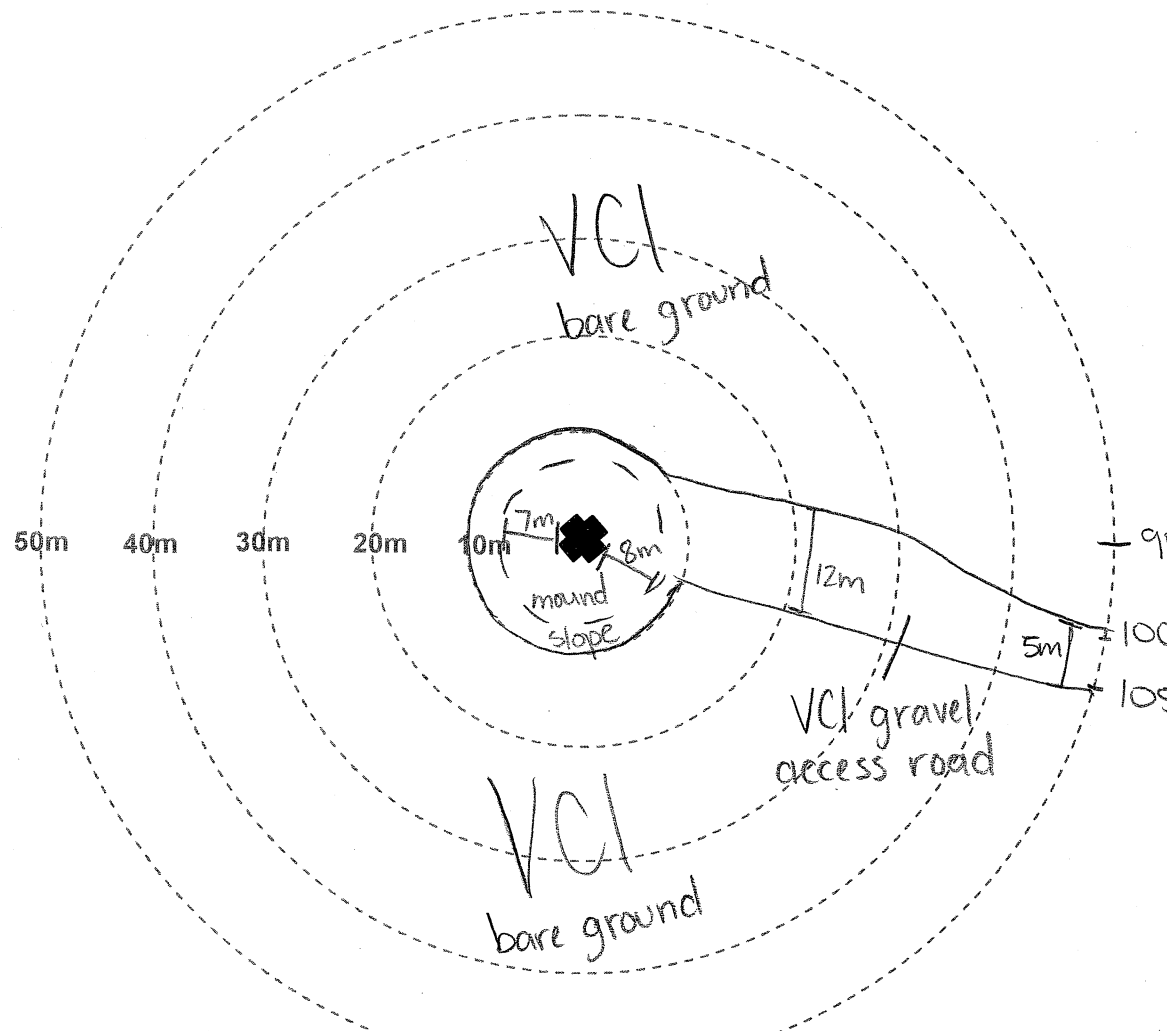
Date (DD/MM/YY): 11 / 07 / 17  
 Observer: Shelby H. Henry A  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



General Habitat Description:  
corn fields, small hedgerow

Photo Numbers (from turbine base)  
 Facing North: 2053  
 Facing East: 2054  
 Facing South: 2055  
 Facing West: 2056  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 08 / 08 / 17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



General Habitat Description:  
corn fields, small hedgerow

VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats



# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 06

Photo Numbers (from turbine base)

Facing North: 2272  
 Facing East: 2273  
 Facing South: 2274  
 Facing West: 2275

(sketch habitat and visibility classes)

Date (DD/MM/YY): 05/09/17

Observer: Shelby H. Henry A.

Monthly/Seasonal  
 Linear Transect Width: 5 m

N

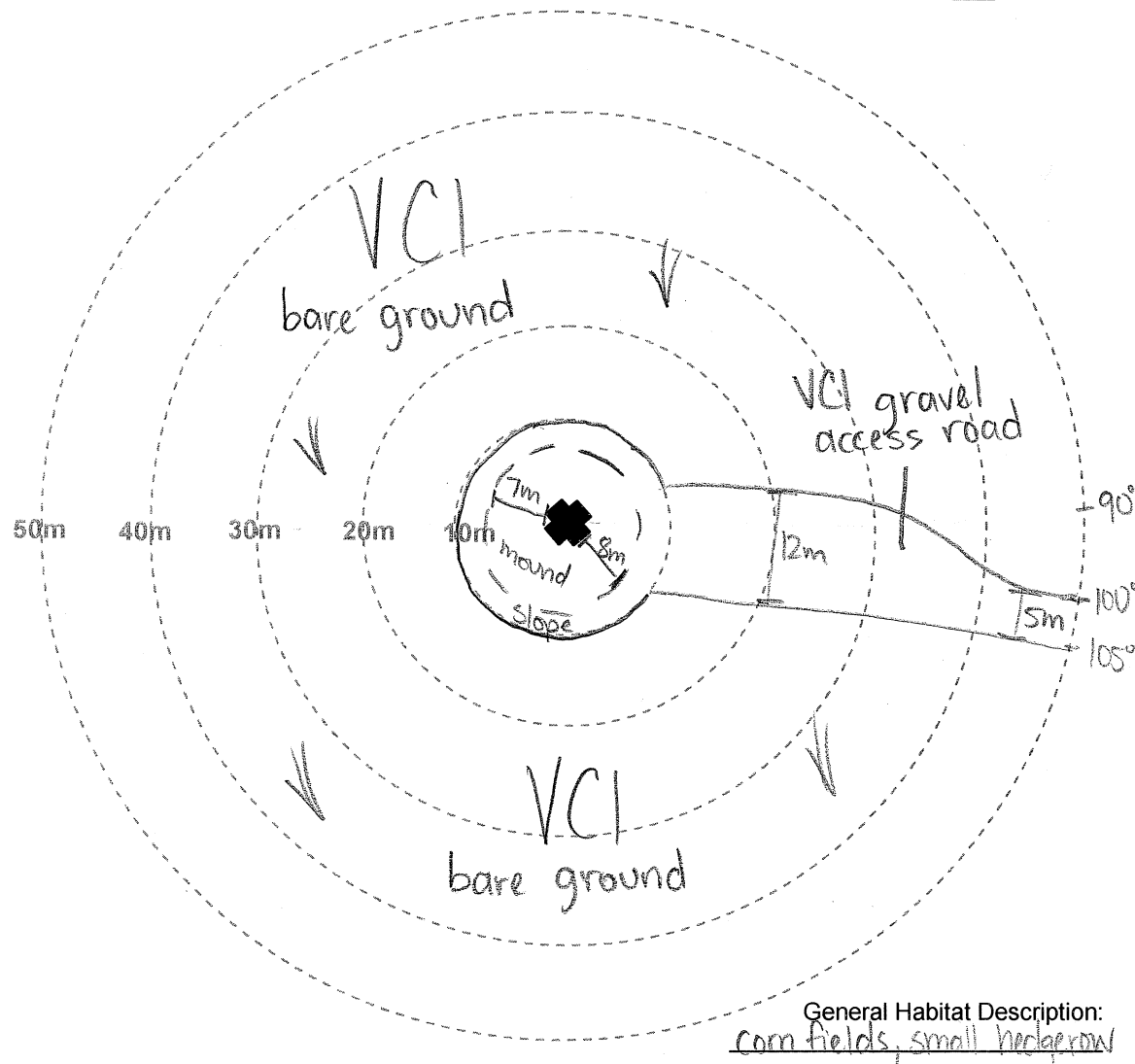


Photo Numbers (from turbine base)

Facing North: 2439  
 Facing East: 2440  
 Facing South: 2441  
 Facing West: 2442

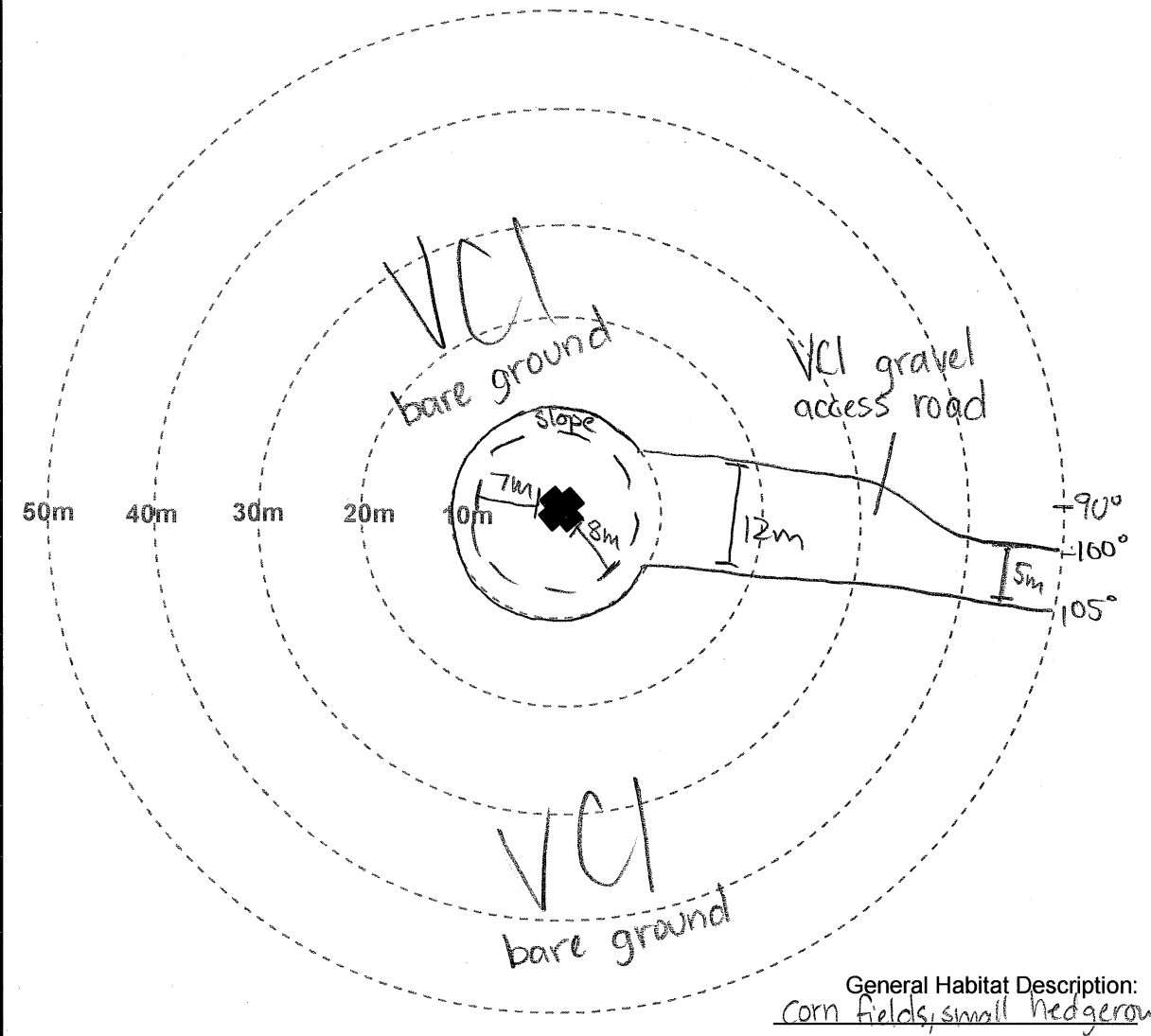
(sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/17

Observer: Shelby H. Henry A.

Monthly/Seasonal  
 Linear Transect Width: 5 m

N



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill Project #: 1875A Turbine #: 7 Degree of Slope 2 degrees Slope Orientation SW (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 1435  
 Facing East: 1436  
 Facing South: 1437  
 Facing West: 1438  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 09/05/17  
 Observer: Shelby H., Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m

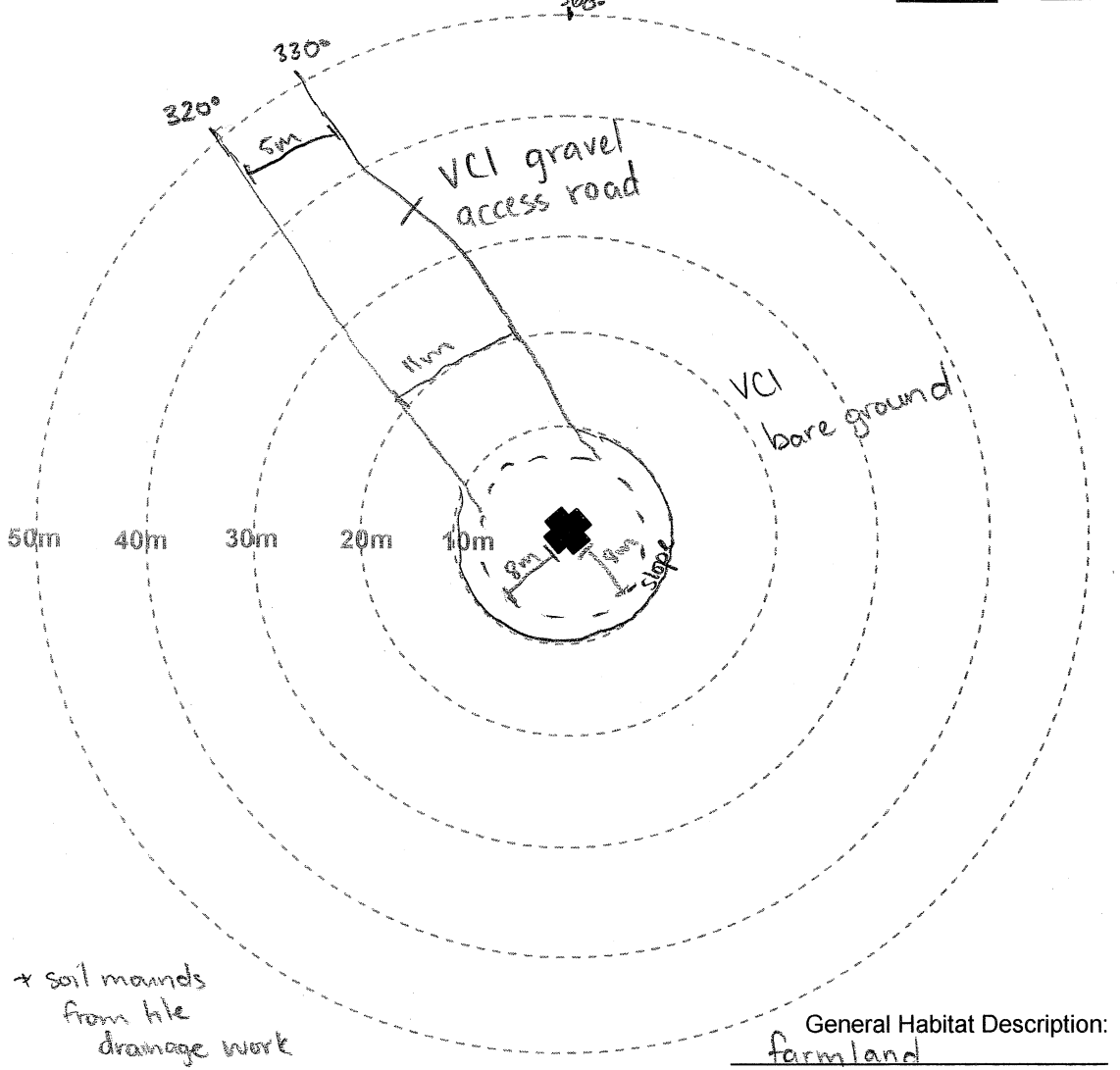
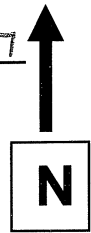
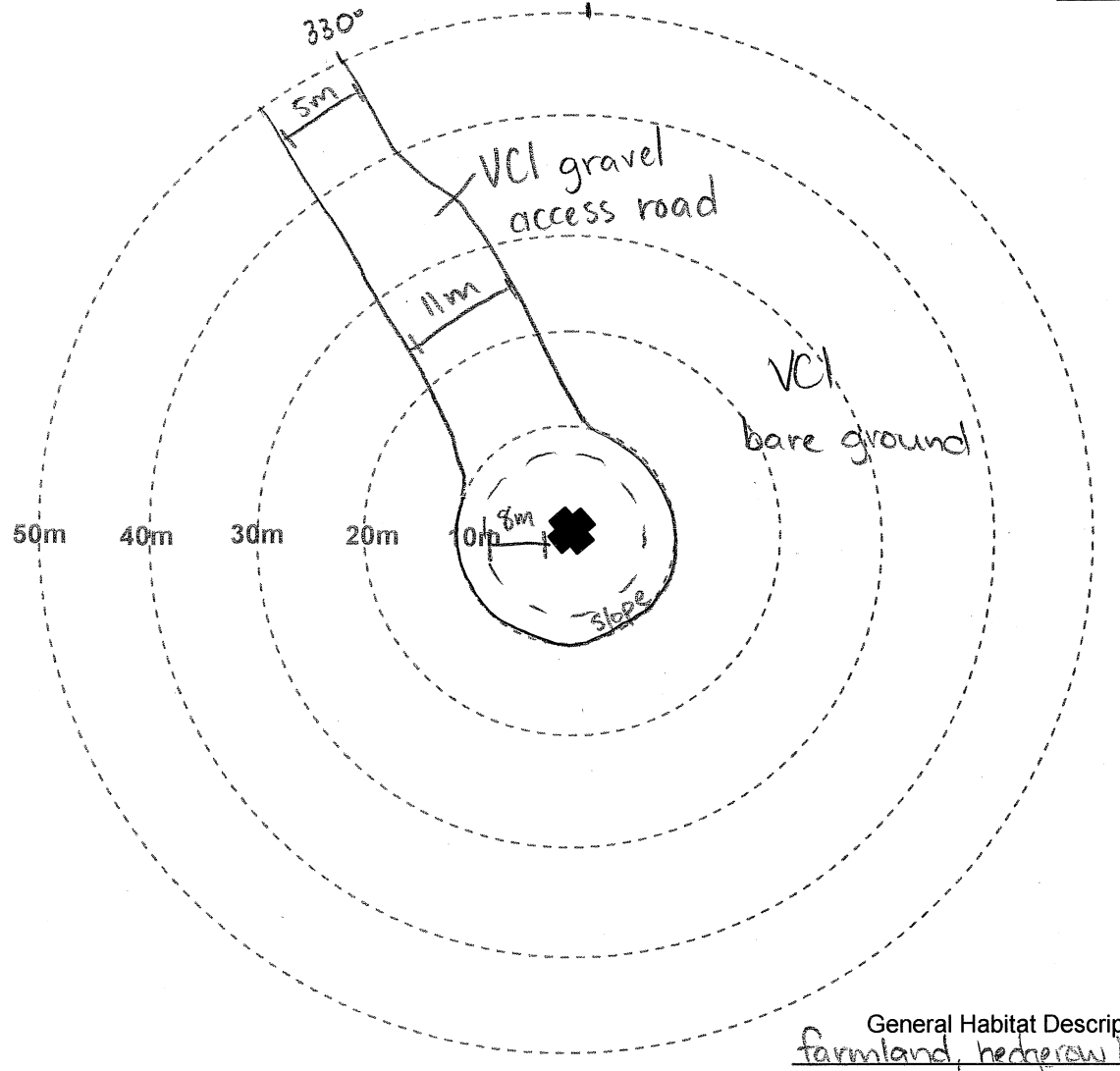


Photo Numbers (from turbine base)  
 Facing North: 1583  
 Facing East: 1584  
 Facing South: 1585  
 Facing West: 1586  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/06/17  
 Observer: Shelby H., Karl H.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 07

Photo Numbers (from turbine base)  
 Facing North: 1870  
 Facing East: 1871  
 Facing South: 1872  
 Facing West: 1873  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 11 / 07 / 17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal Linear Transect Width: 5 m

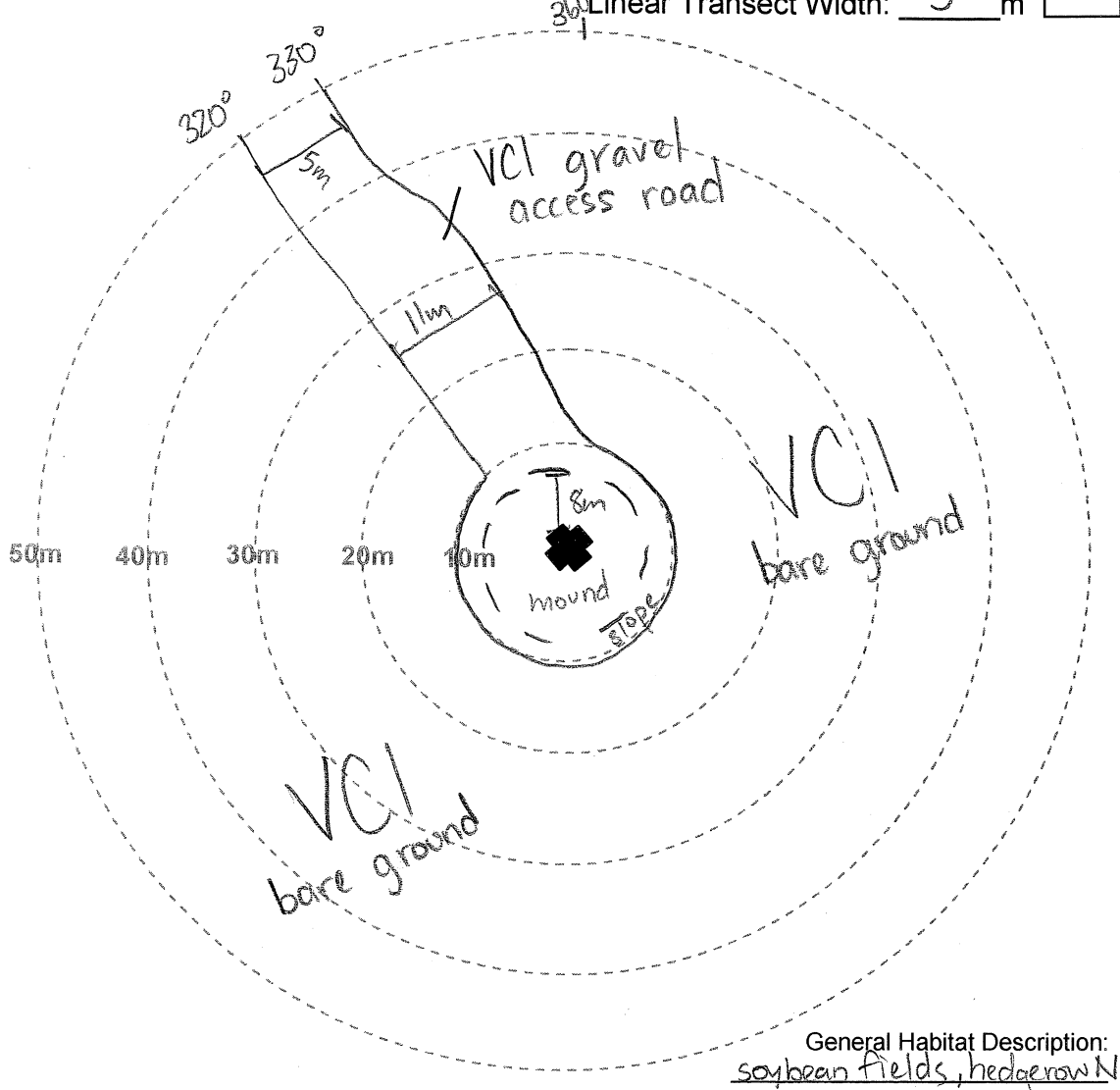
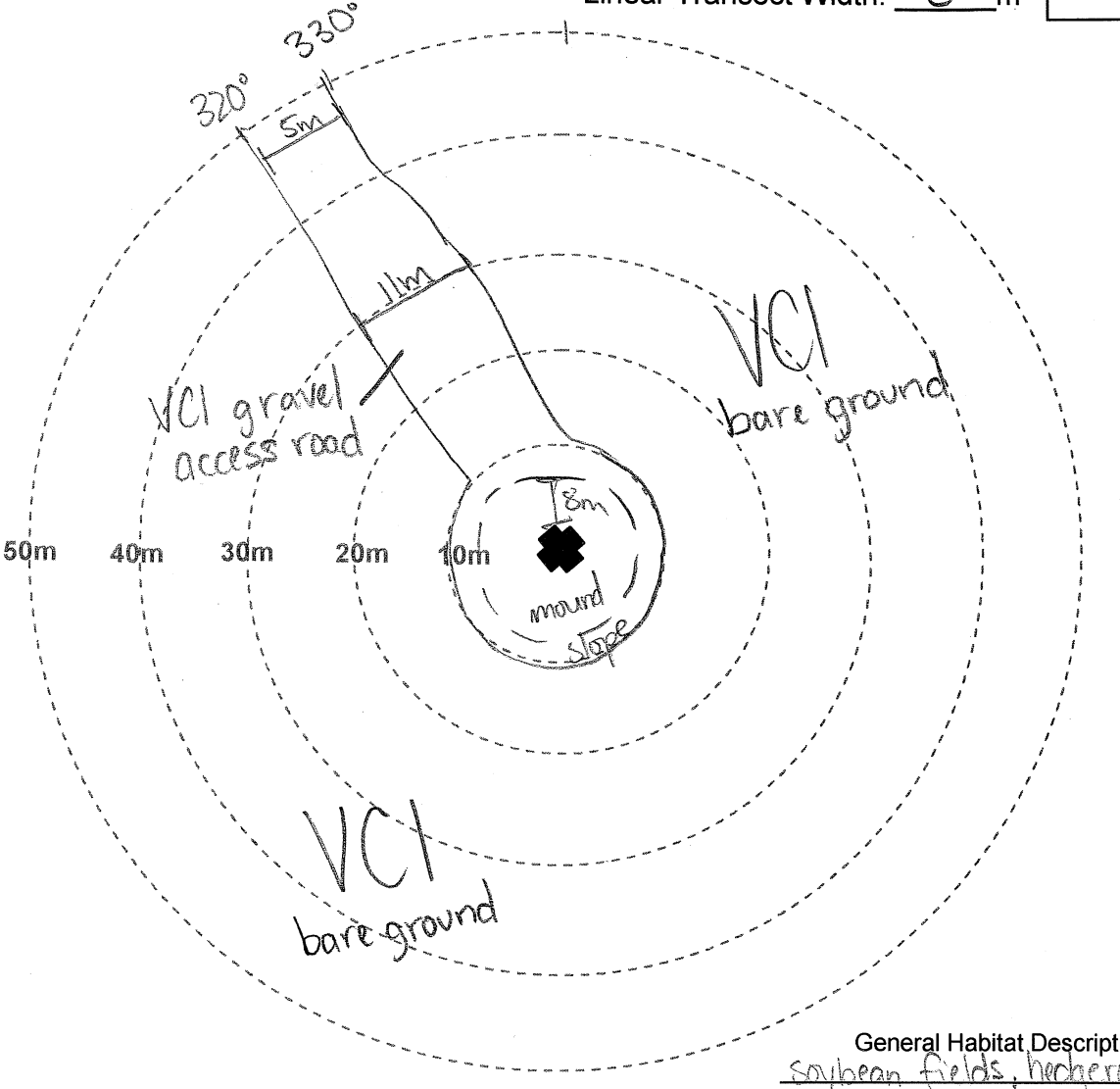


Photo Numbers (from turbine base)  
 Facing North: 2060  
 Facing East: 2061  
 Facing South: 2062  
 Facing West: 2063  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 08 / 08 / 17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 07

Photo Numbers (from turbine base)

Facing North: 2323

Facing East: 2324

Facing South: 2325

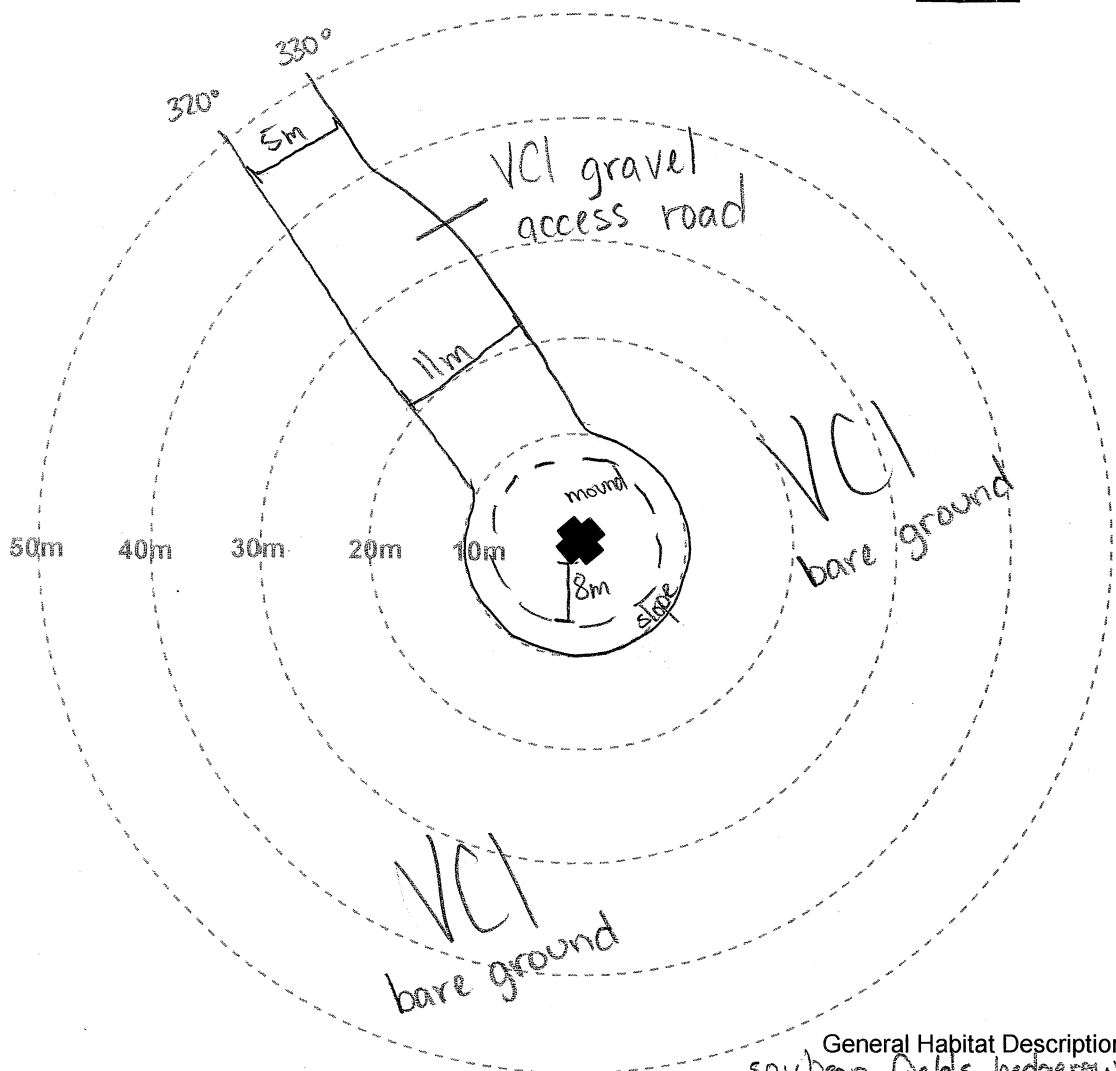
Facing West: 2326

(sketch habitat and visibility classes)

Date (DD/MM/YY): 12/09/17

Observer: Shelby H. Henry A.

Monthly/Seasonal  
Linear Transect Width: 5 m



General Habitat Description:  
soybean fields, hedgerow N

Photo Numbers (from turbine base)

Facing North: 2445

Facing East: 2446

Facing South: 2447

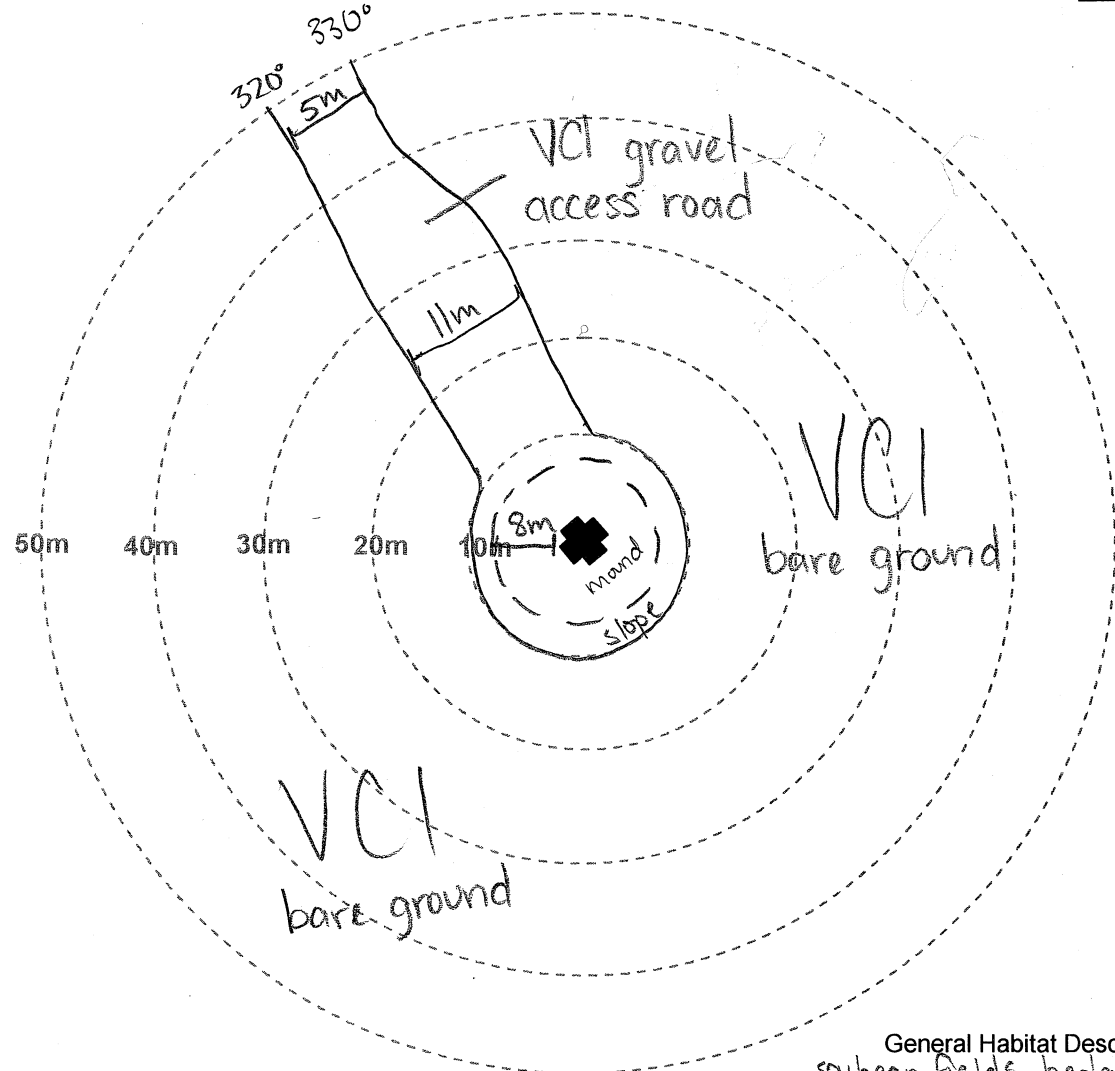
Facing West: 2448

(sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/17

Observer: Shelby H. Henry A.

Monthly/Seasonal  
Linear Transect Width: 5 m



General Habitat Description:  
soybean fields, hedgerow N

VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill Project #: 1875A Turbine #: 8 Degree of Slope 4 degrees Slope Orientation S (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 1440  
 Facing East: 1441  
 Facing South: 1442  
 Facing West: 1443  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 09/05/17  
 Observer: Shelby H., Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m

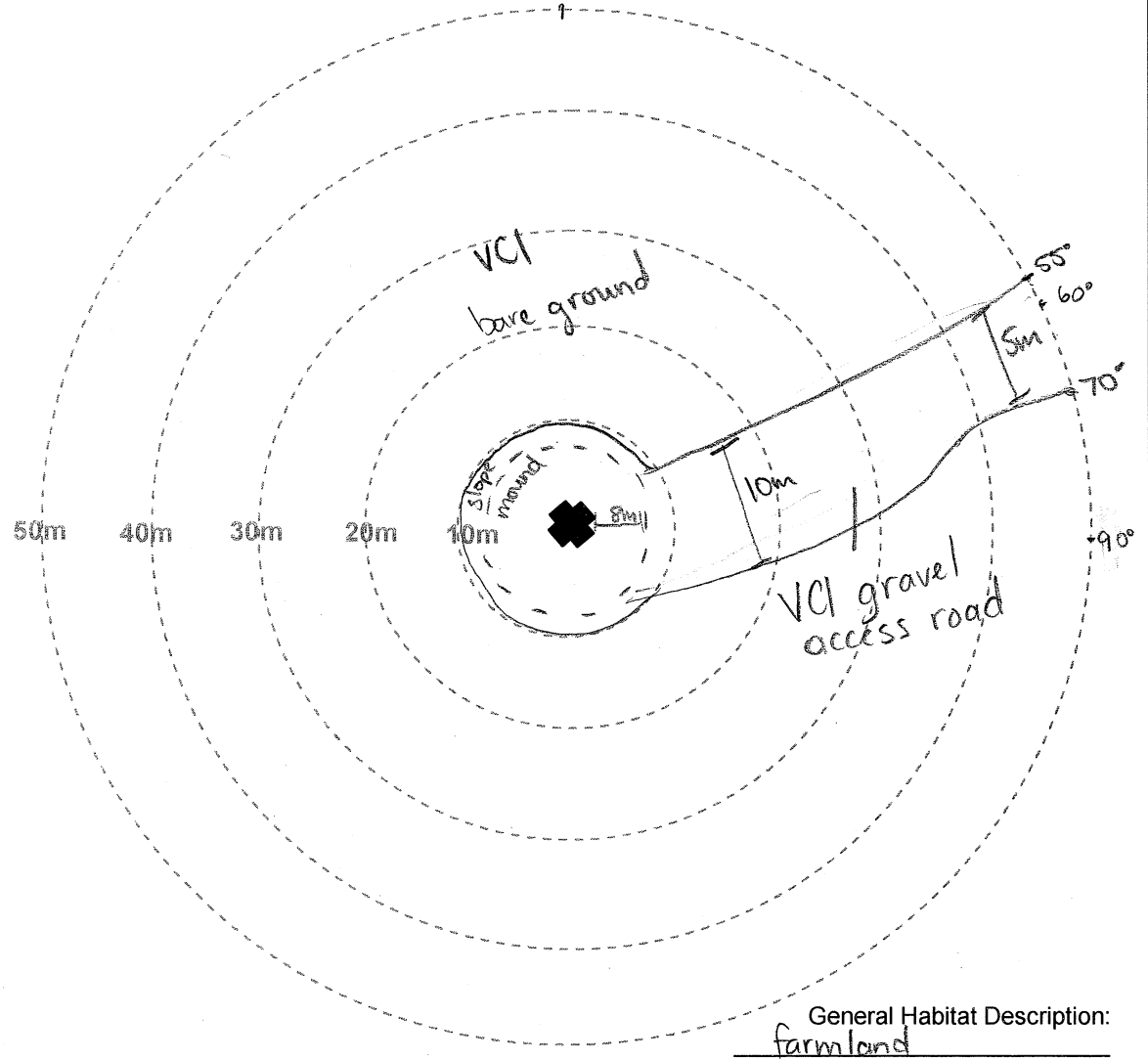
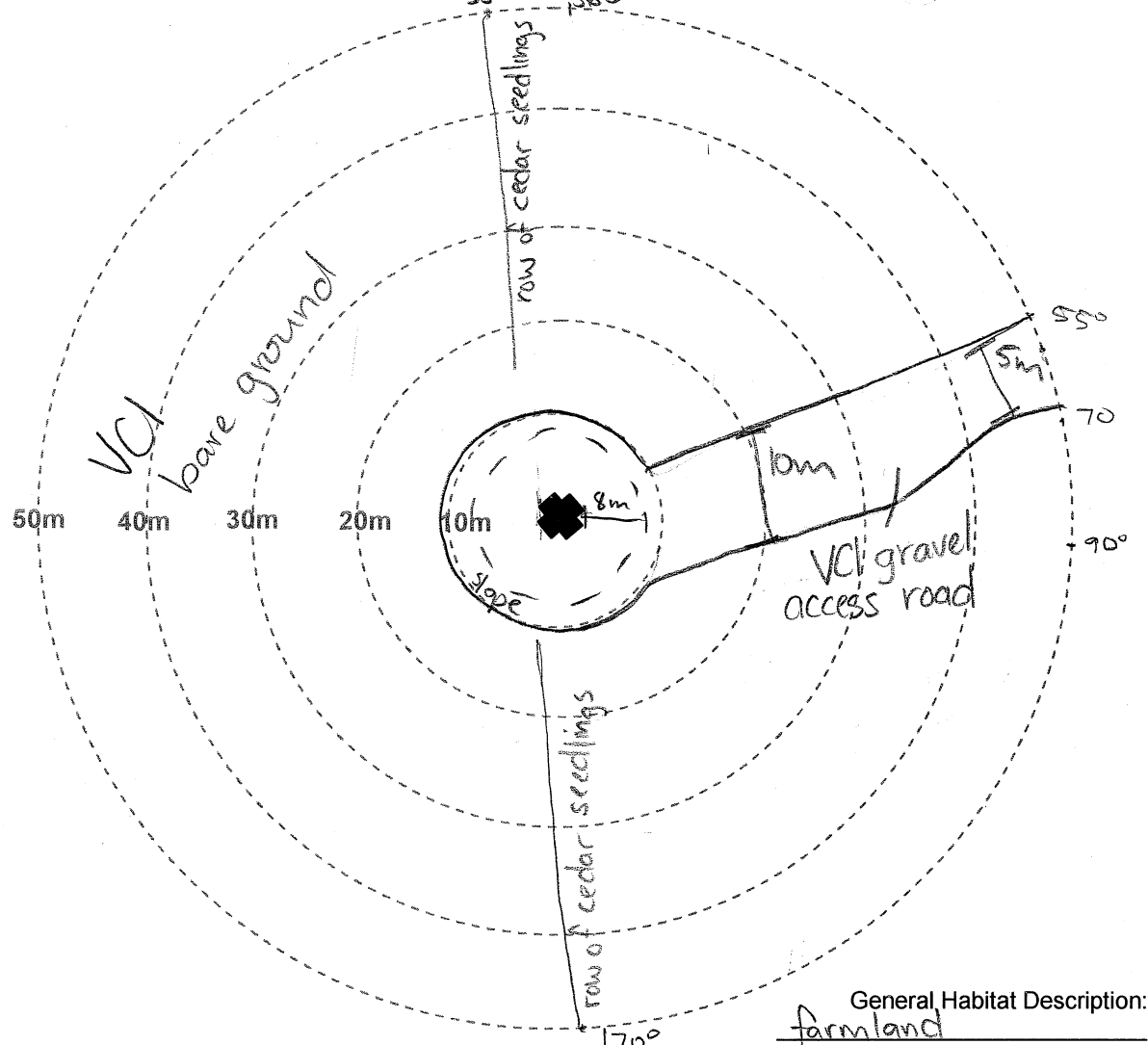


Photo Numbers (from turbine base)  
 Facing North: 1588  
 Facing East: 1589  
 Facing South: 1590  
 Facing West: 1591  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/06/17  
 Observer: Shelby H., Karl H.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 08

Photo Numbers (from turbine base)  
 Facing North: 1874  
 Facing East: 1875  
 Facing South: 1876  
 Facing West: 1877  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 11/07/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m

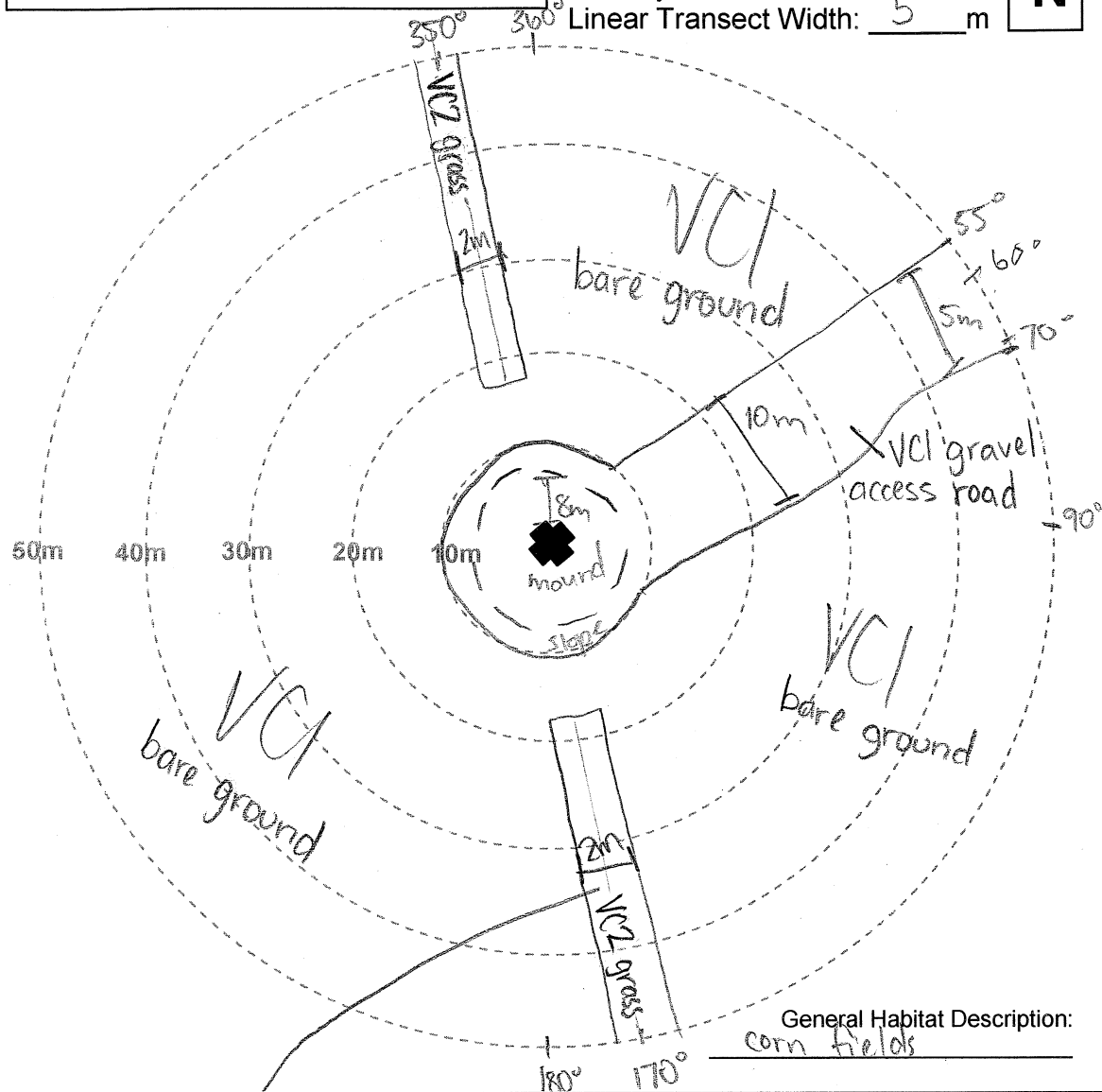
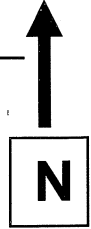
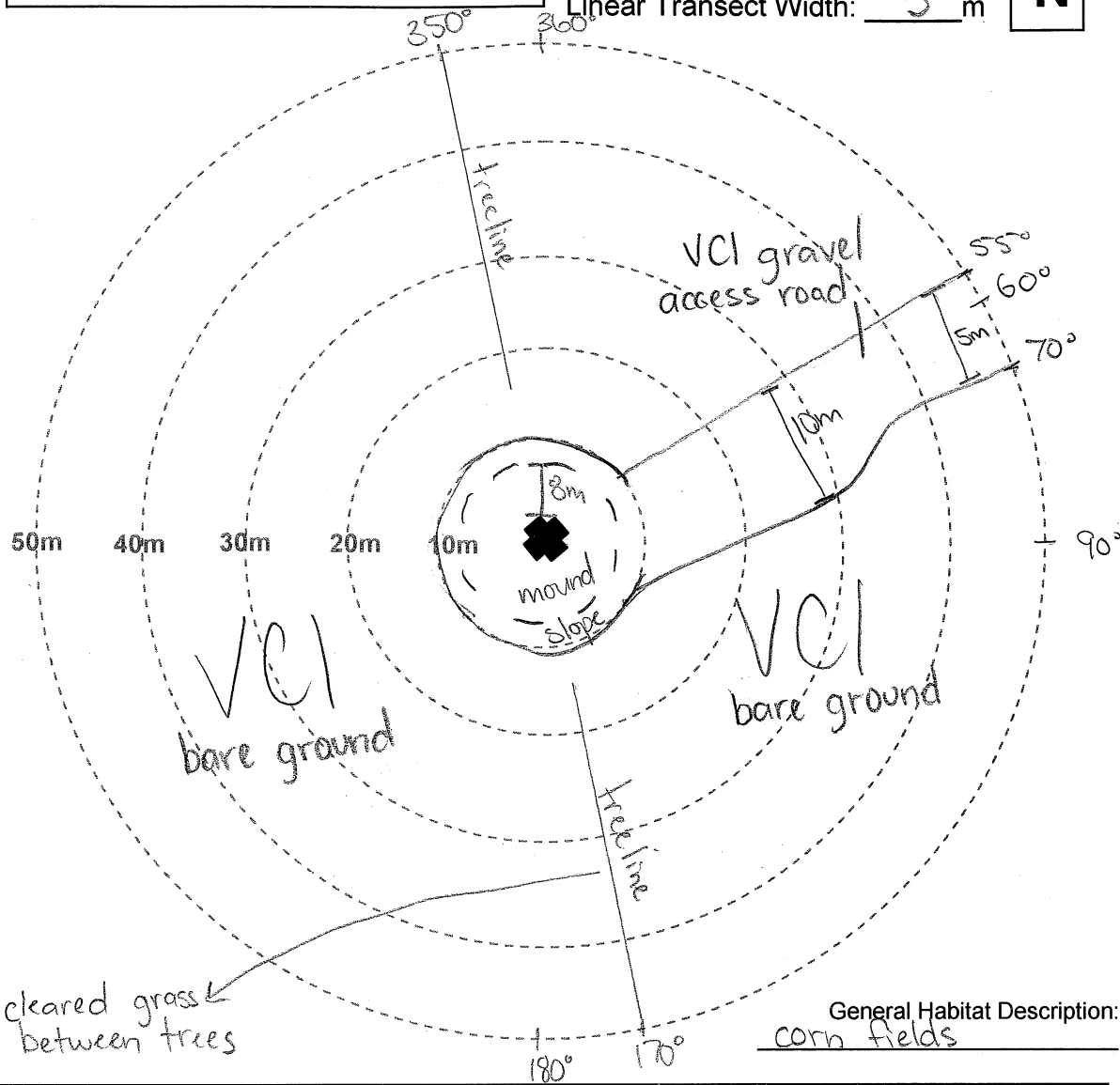


Photo Numbers (from turbine base)  
 Facing North: 2064  
 Facing East: 2065  
 Facing South: 2066  
 Facing West: 2067  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 08/08/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



\* cannot be ploughed  
 between small cedars  
 planted in row  
 ∴ VC2

VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 08

Photo Numbers (from turbine base)  
 Facing North: 2327  
 Facing East: 2328  
 Facing South: 2329  
 Facing West: 2330  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 12/09/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m

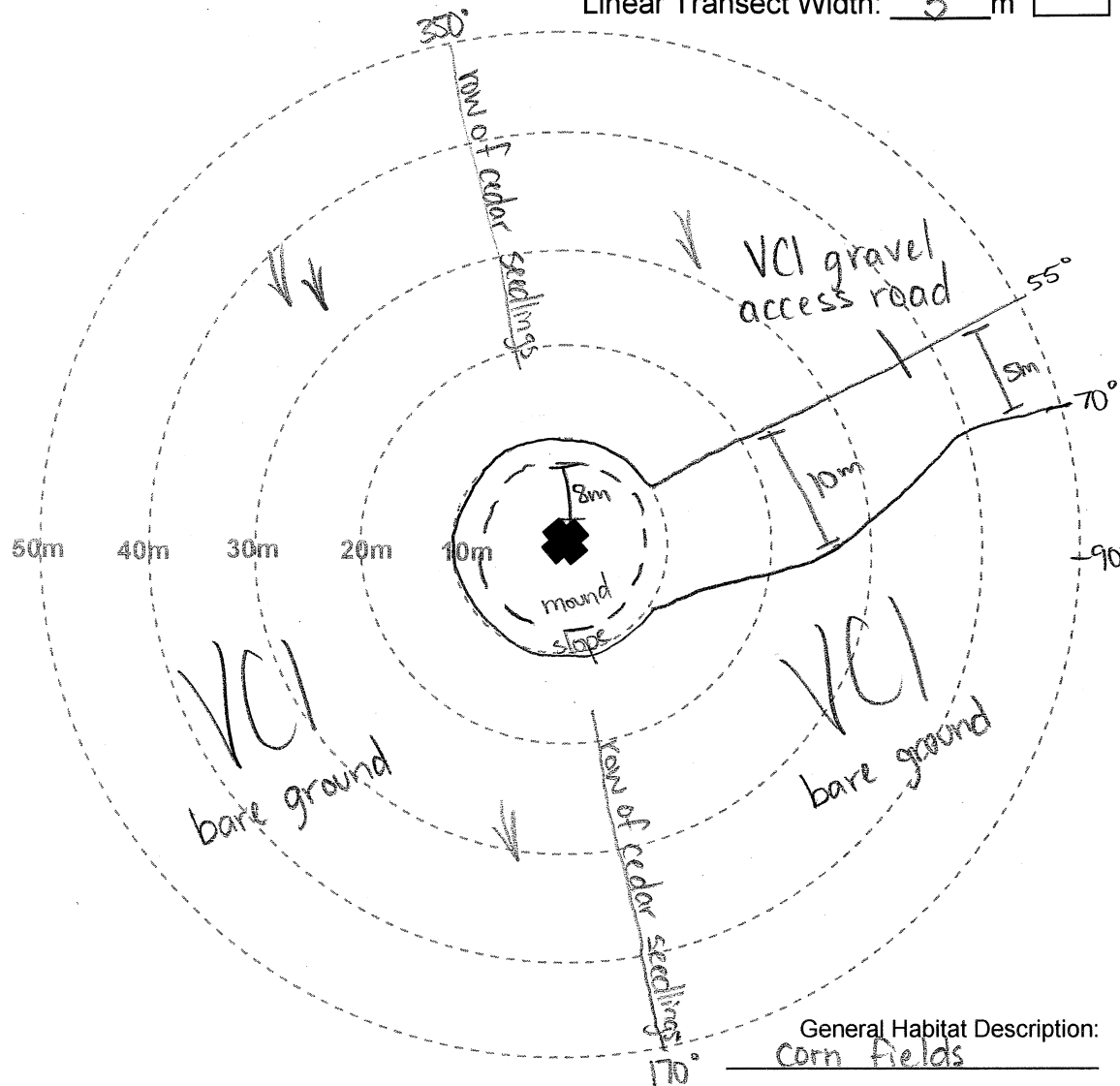
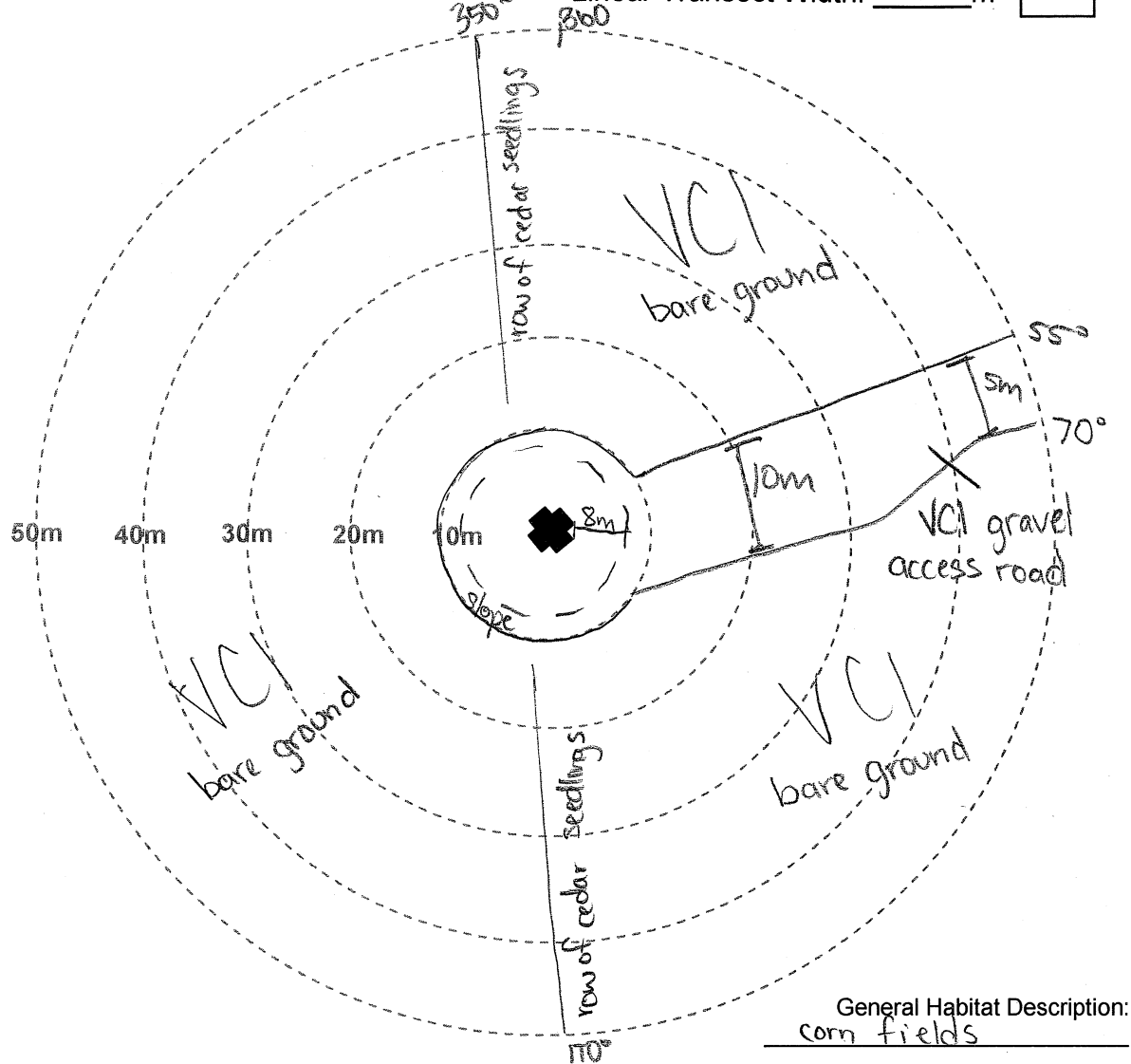


Photo Numbers (from turbine base)  
 Facing North: 2449  
 Facing East: 2450  
 Facing South: 2451  
 Facing West: 2452  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill Project #: 1875A Turbine #: 9 Degree of Slope 2 degrees Slope Orientation ESE (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 1518  
 Facing East: 1519  
 Facing South: 1520  
 Facing West: 1521  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 16/05/17  
 Observer: Shelby H. Henry A.

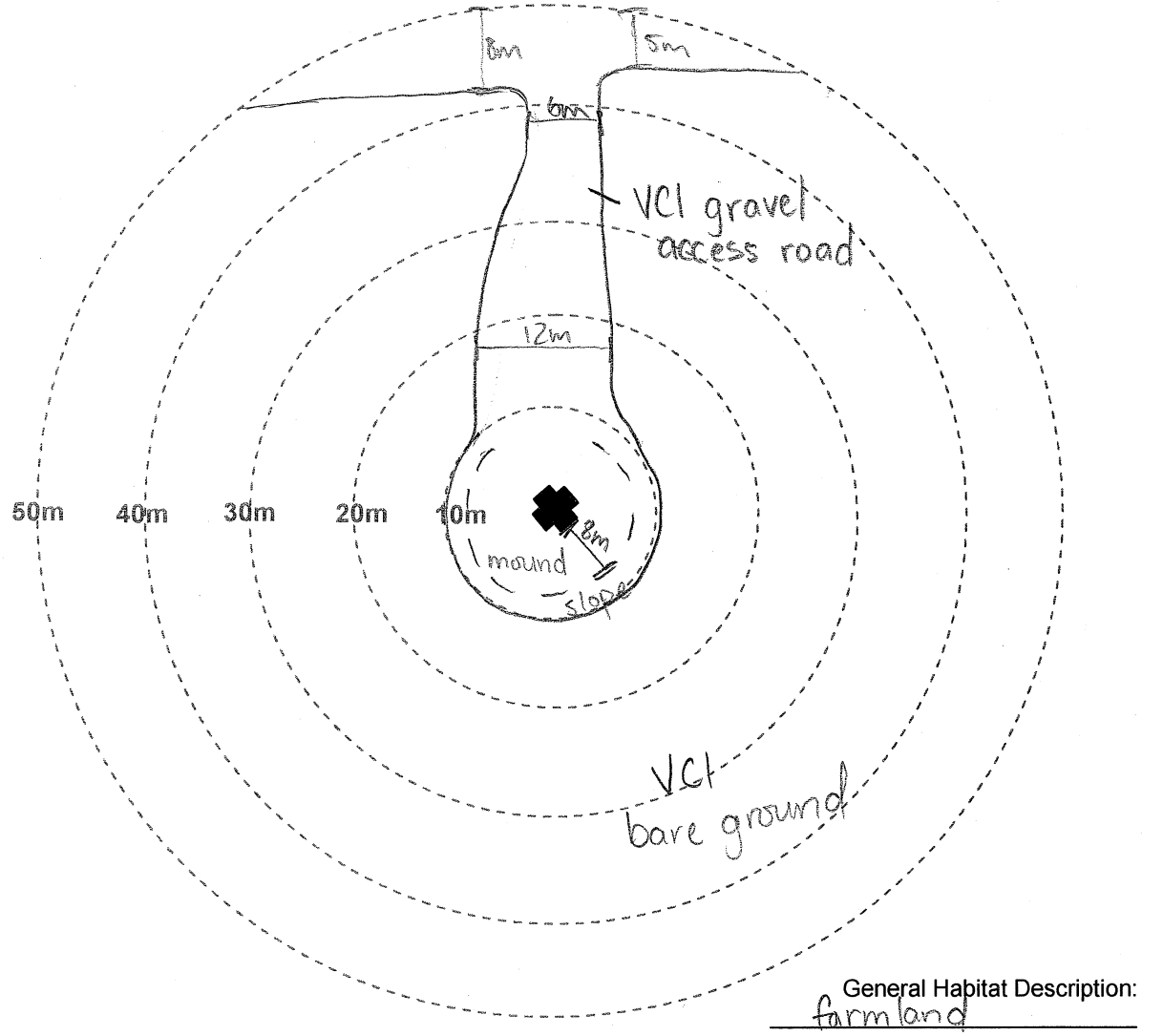
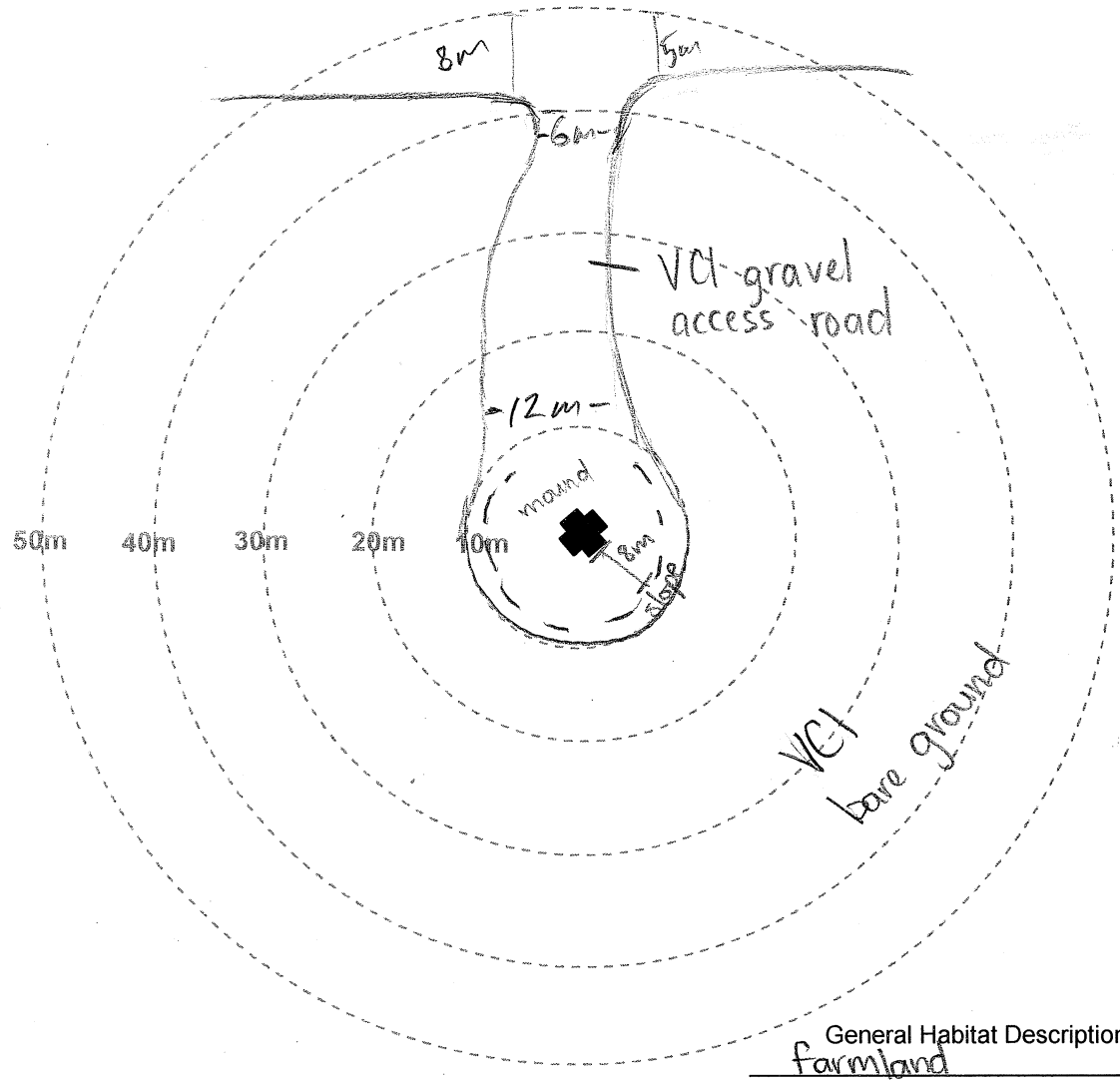
Monthly/Seasonal  
 Linear Transect Width: 5 m



Photo Numbers (from turbine base)  
 Facing North: 1624  
 Facing East: 1625  
 Facing South: 1626  
 Facing West: 1627  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 06/06/17  
 Observer: Shelby H. Henry A.

Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats



# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 09

Photo Numbers (from turbine base)

Facing North: 1778

Facing East: 1779

Facing South: 1780

Facing West: 1781

(sketch habitat and visibility classes)

Date (DD/MM/YY): 04/07/17

Observer: Shelby H. Henry A

Monthly/Seasonal  
Linear Transect Width: 5 m

N

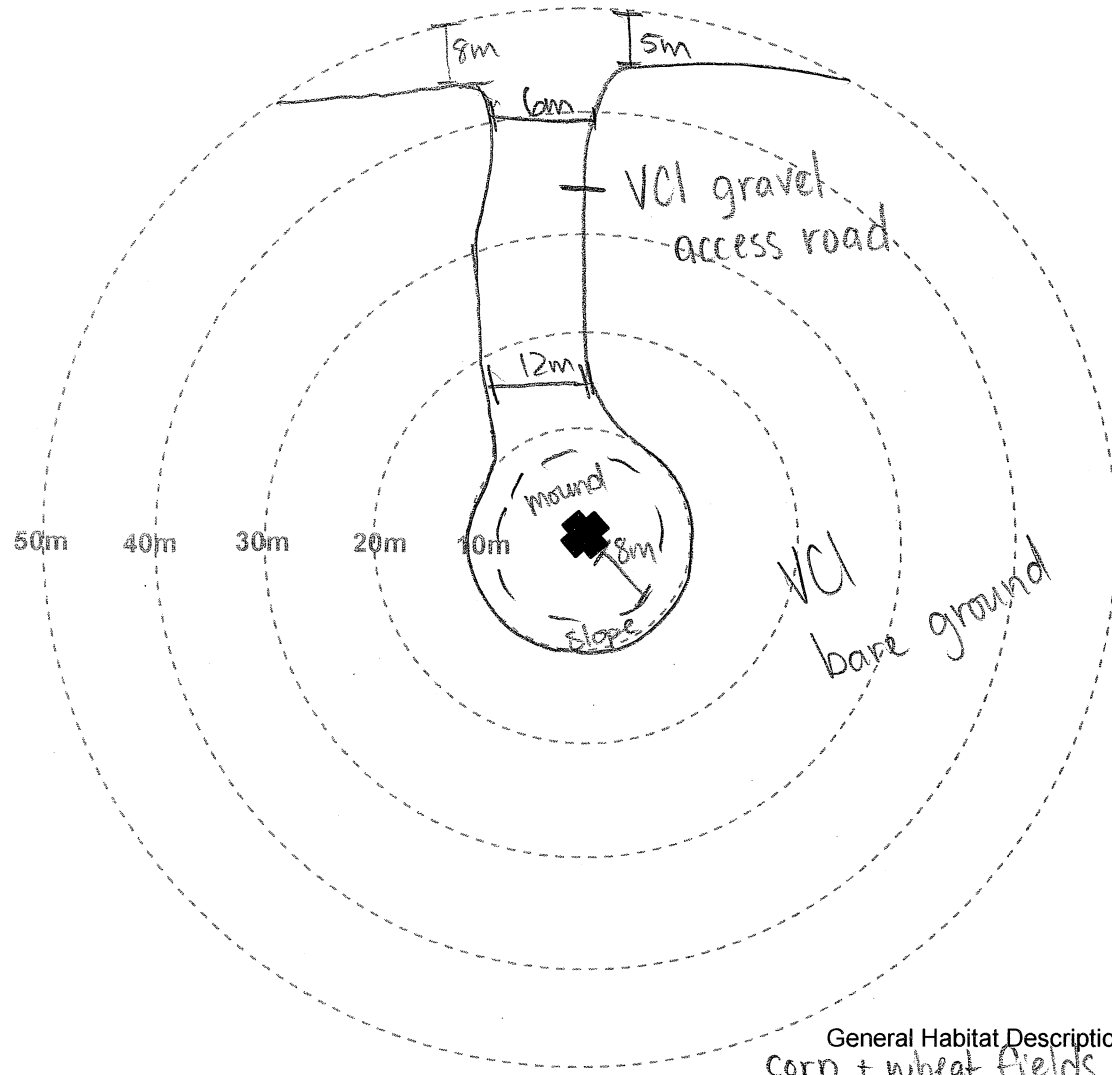


Photo Numbers (from turbine base)

Facing North: 2068

Facing East: 2069

Facing South: 2070

Facing West: 2071

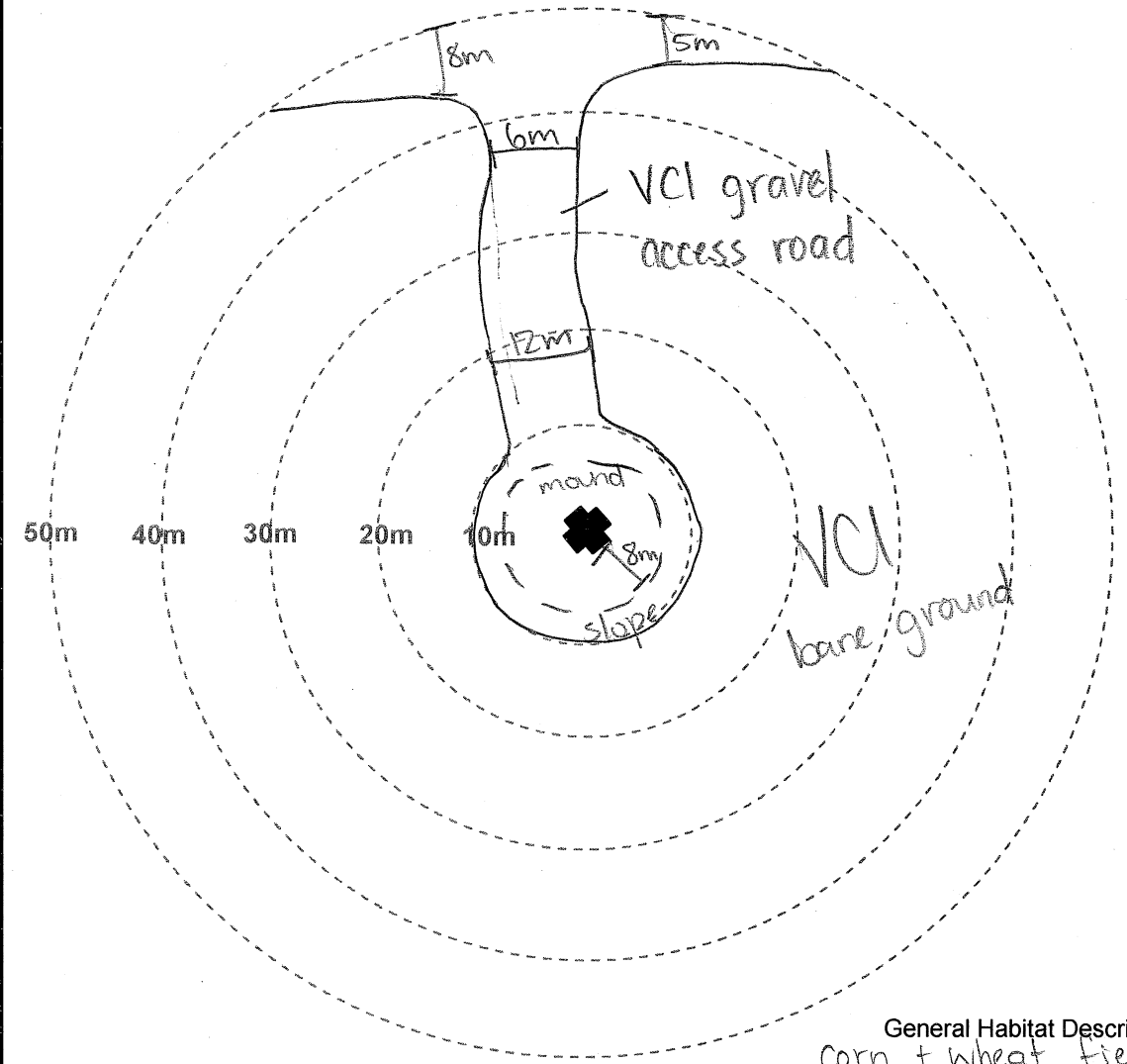
(sketch habitat and visibility classes)

Date (DD/MM/YY): 08/08/17

Observer: Shelby H. Henry A.

Monthly/Seasonal  
Linear Transect Width: 5 m

N



## VISIBILITY CLASSES

Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 09

Photo Numbers (from turbine base)  
 Facing North: 2331  
 Facing East: 2332  
 Facing South: 2333  
 Facing West: 2334  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 12/09/17  
 Observer: Shelby H. Henry A  
 Monthly/Seasonal  
 Linear Transect Width: 5 m

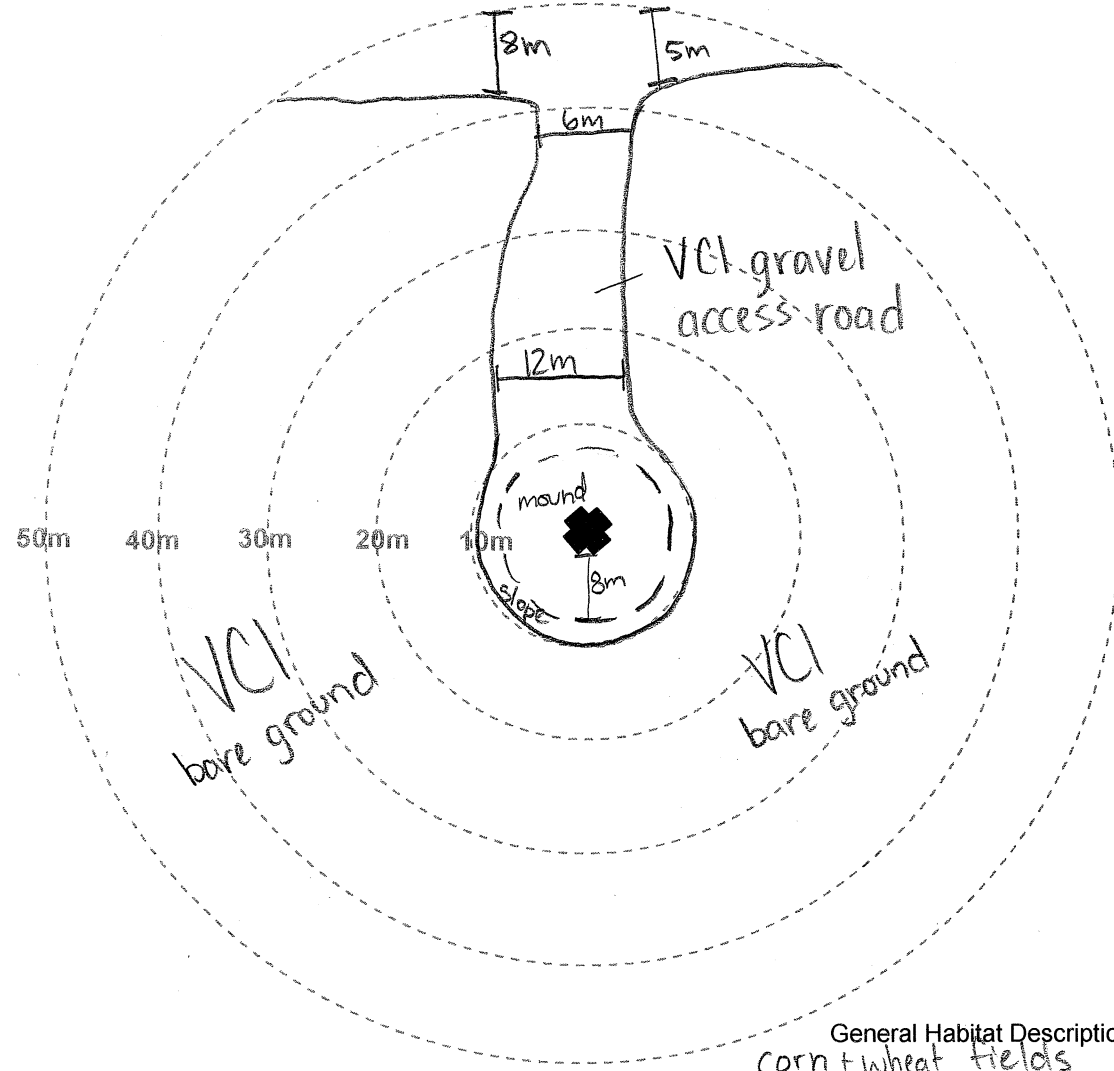
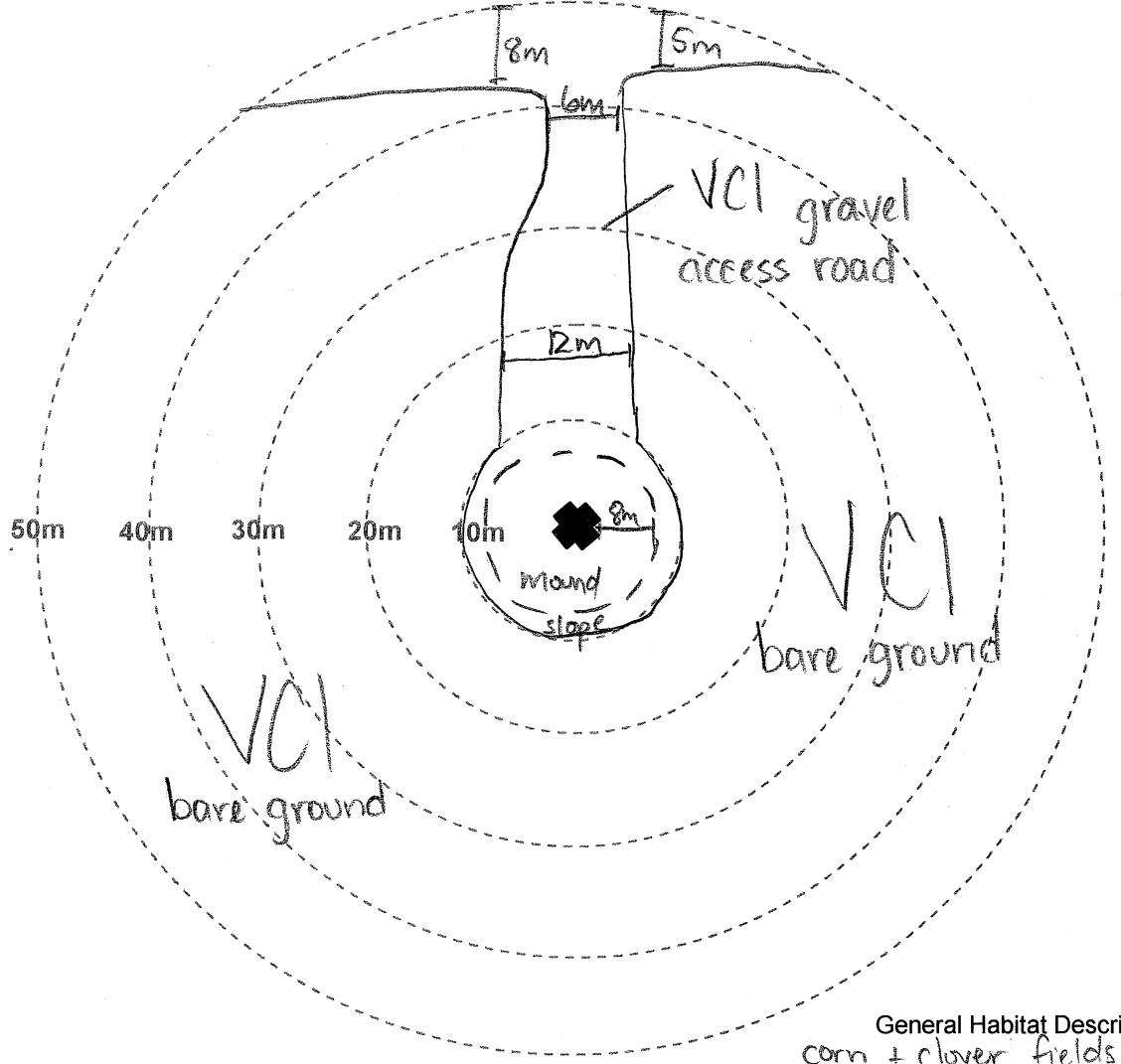


Photo Numbers (from turbine base)  
 Facing North: 2453  
 Facing East: 2454  
 Facing South: 2455  
 Facing West: 2456  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill Project #: 1875A Turbine #: 10 Degree of Slope 0 degrees Slope Orientation N/A (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 1444  
 Facing East: 1445  
 Facing South: 1446  
 Facing West: 1447  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 09/05/17  
 Observer: Shelby H.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m

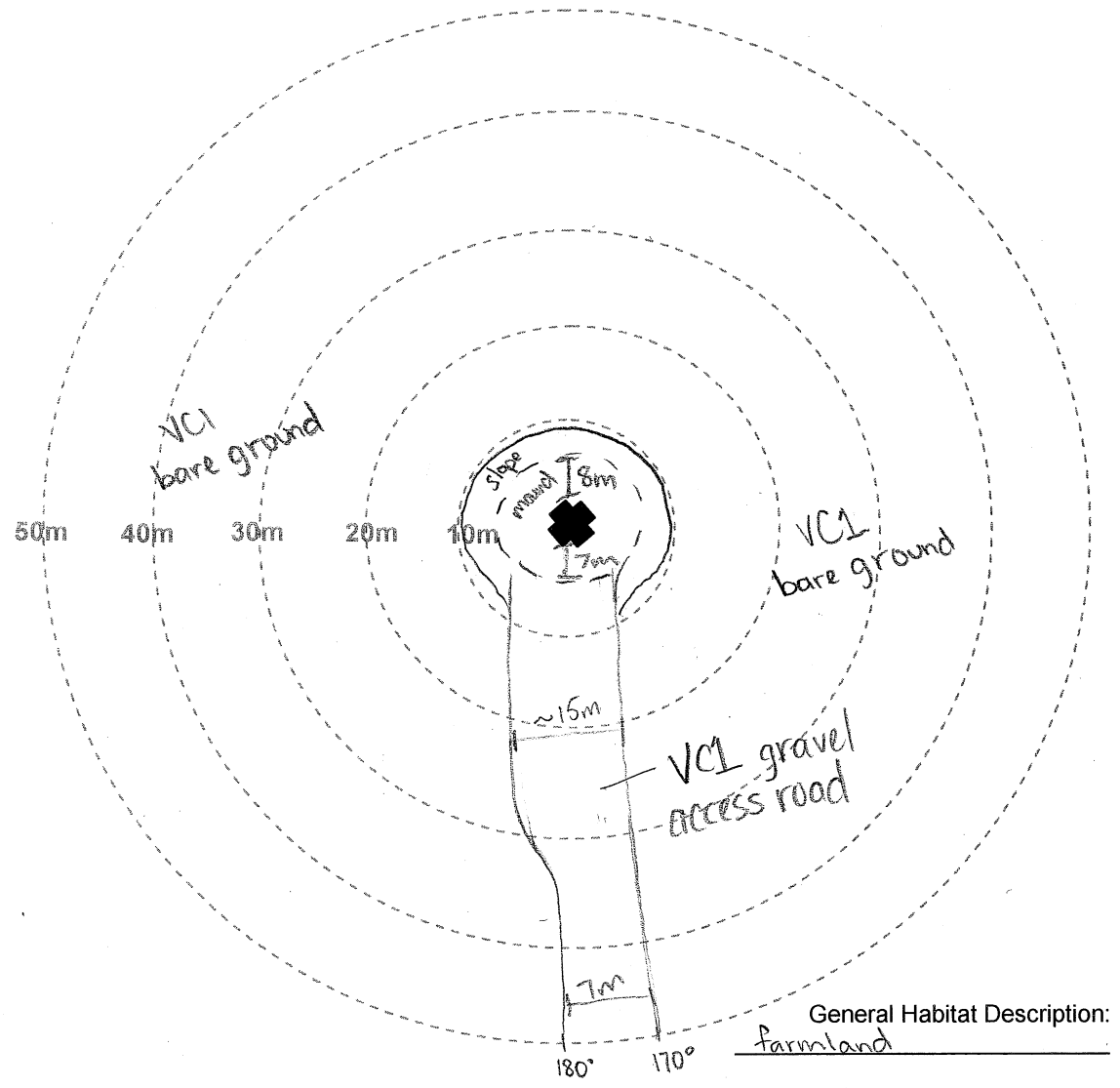
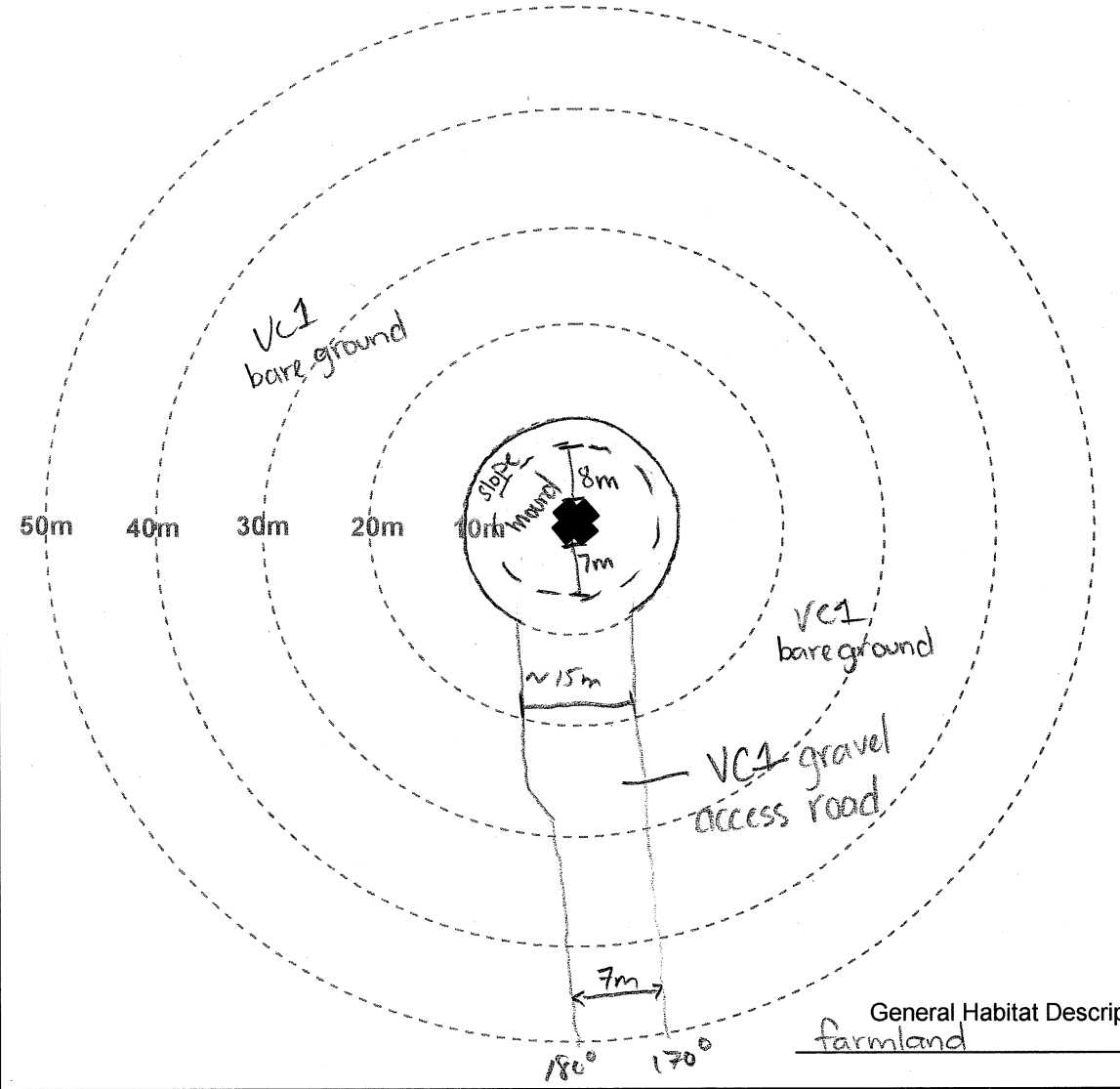


Photo Numbers (from turbine base)  
 Facing North: 1629  
 Facing East: 1630  
 Facing South: 1631  
 Facing West: 1632  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 06/06/17  
 Observer: Shelby H., Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875 Turbine #: 10

Photo Numbers (from turbine base)  
 Facing North: 1879  
 Facing East: 1880  
 Facing South: 1881  
 Facing West: 1883  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 11/07/17  
 Observer: Shelby H. Henry A  
 Monthly/Seasonal  
 Linear Transect Width: 5 m

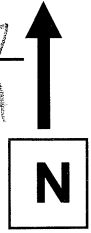
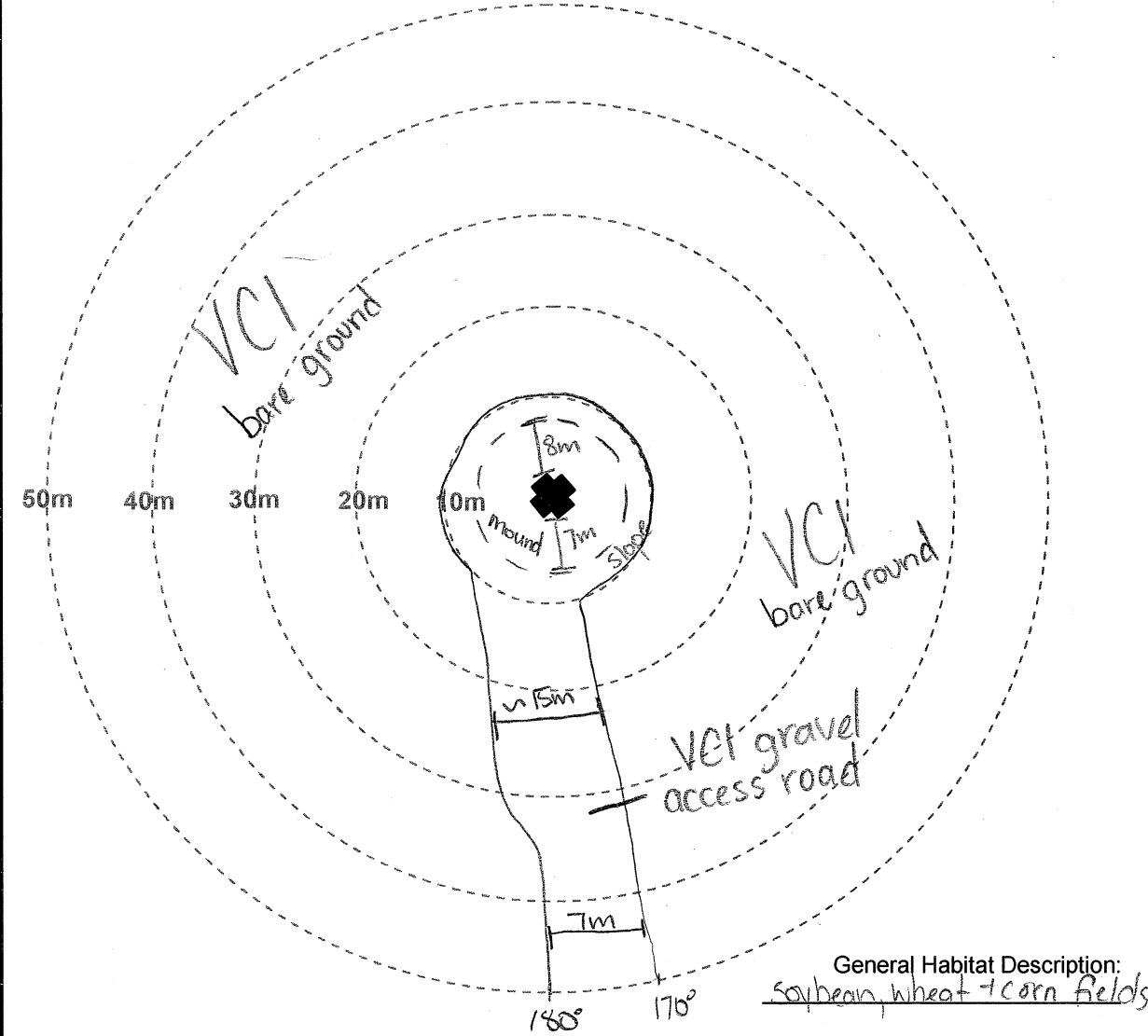
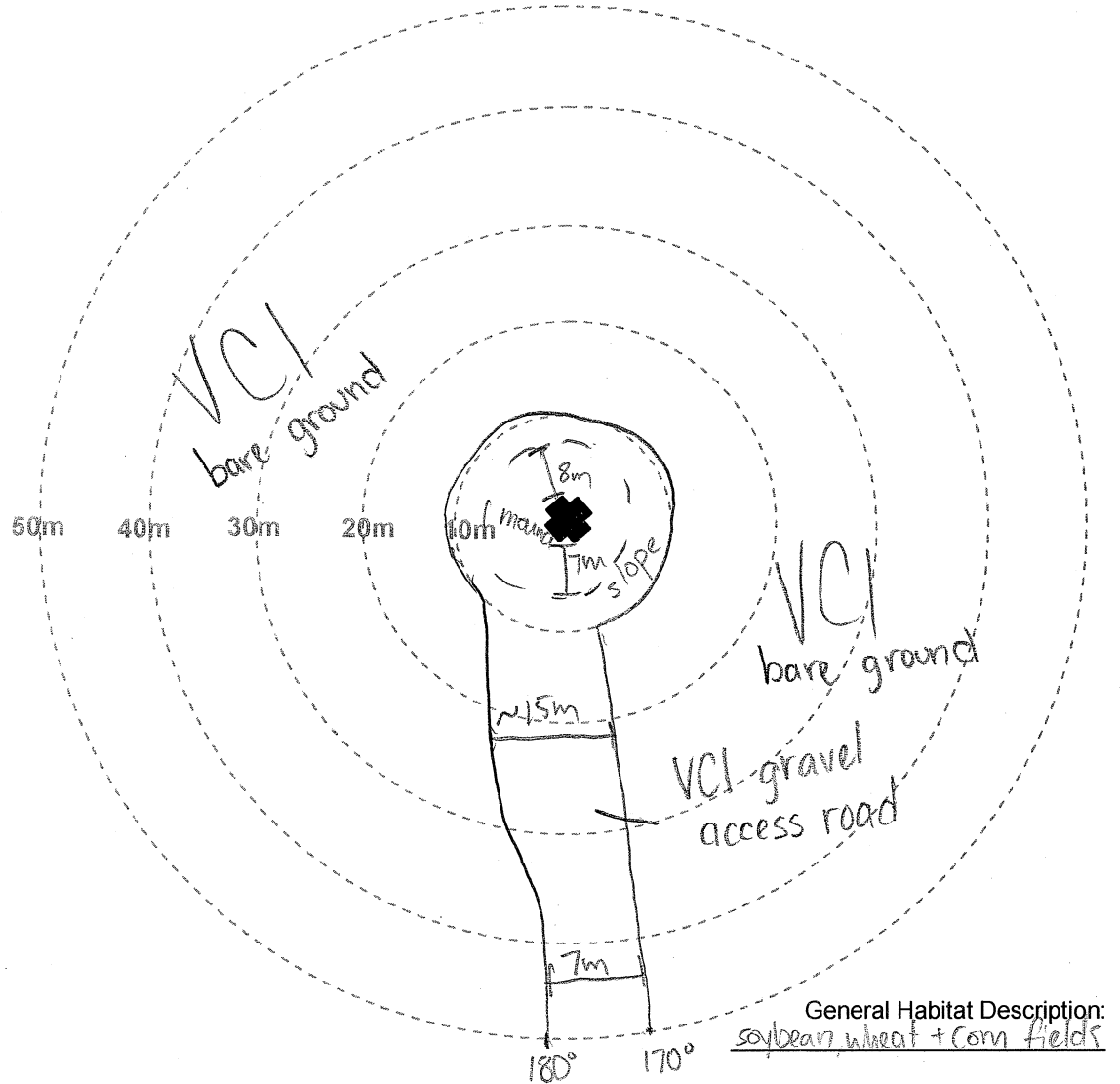
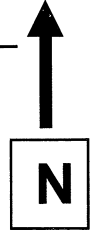


Photo Numbers (from turbine base)  
 Facing North: 2116  
 Facing East: 2117  
 Facing South: 2118  
 Facing West: 2119  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 15/08/17  
 Observer: Shelby H. Henry A  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

# Visibility Class Map

Project Name: Gunn's Hill

Project #: 1875A Turbine #: 10

Photo Numbers (from turbine base)  
 Facing North: 2279  
 Facing East: 2280  
 Facing South: 2281  
 Facing West: 2282  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 05/09/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m

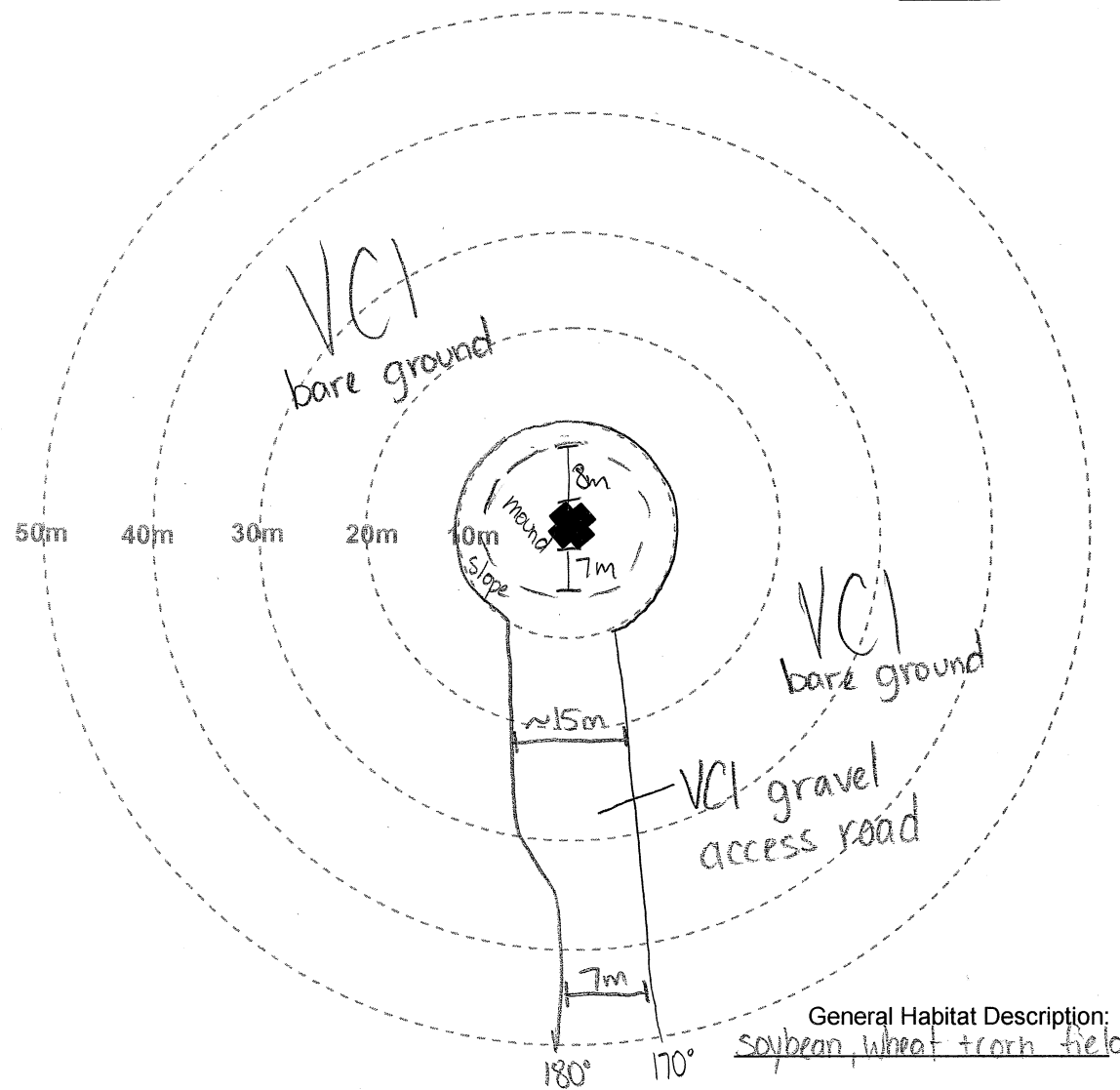
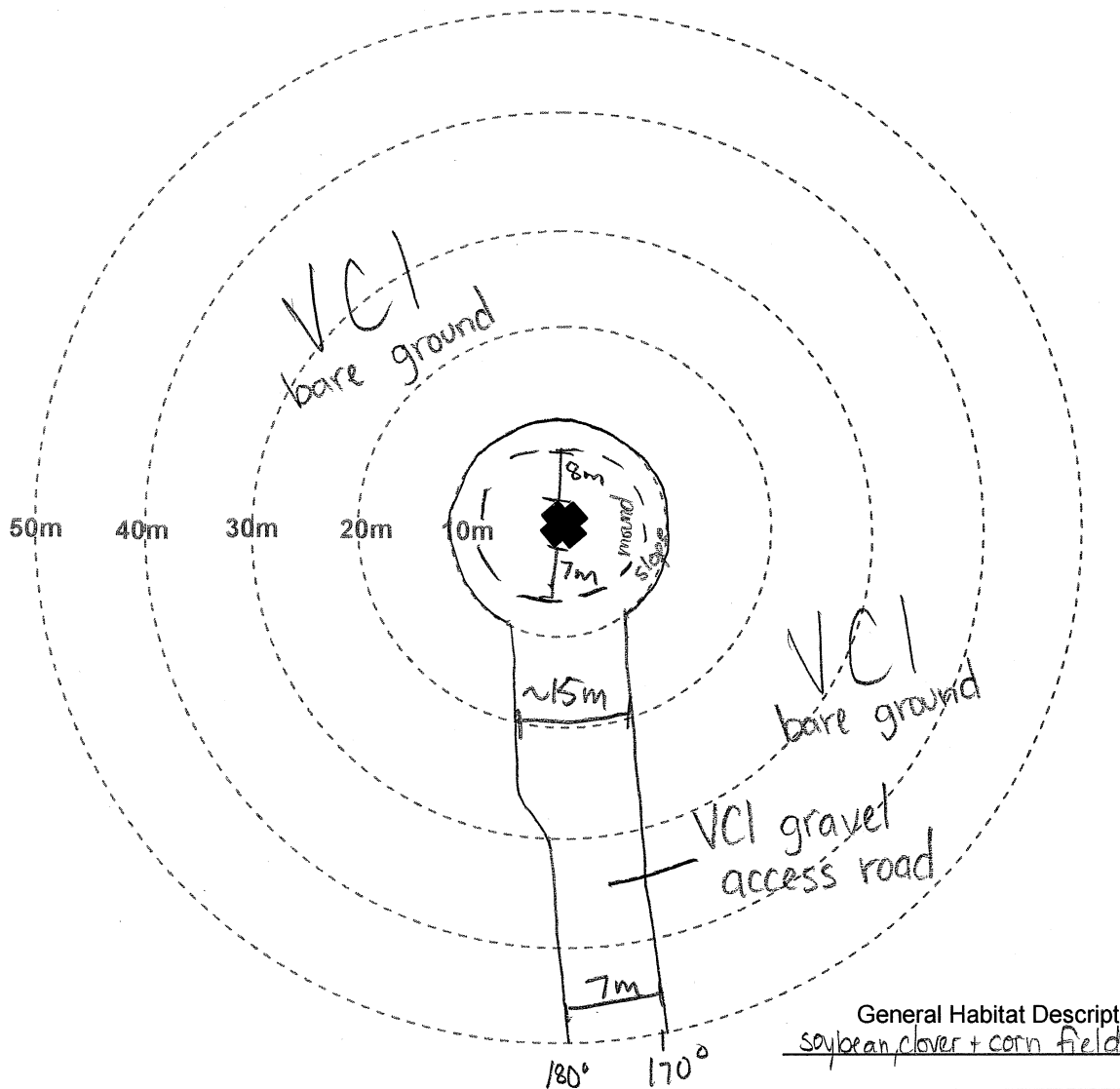


Photo Numbers (from turbine base)  
 Facing North: 2458  
 Facing East: 2459  
 Facing South: 2460  
 Facing West: 2461  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/17  
 Observer: Shelby H. Henry A.  
 Monthly/Seasonal  
 Linear Transect Width: 5 m



VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable habitats