Gunn's Hill Wind Farm
2018 Post-Construction Mortality Monitoring Report

Prepared for:
GHLP General Partner Inc.
c/o Prowind Inc.
12 James Street North, Suite 202
Hamilton, ON
L8R 2J9

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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Gunn's Hill Wind Farm
2018 Post-construction Mortality Monitoring Report

Project Team:

Staff	Role
Christy Humphrey	Project Advisor/Biologist
Shelby Hofstetter	Project Manager/Biologist
Cassandra Zatka	Biologist
Erin Bannon	Biologist
Gavin Friend	Biologist
Rachel Young	Biologist
Kaitlin Filippov	GIS Technician

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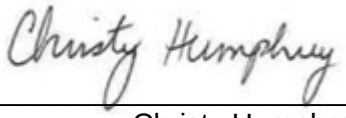

Christy Humphrey
Terrestrial and Wetland Biologist

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, 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 second year of post-construction monitoring for bird and bat mortality conducted at the Gunn's Hill Wind Farm in 2018.

During twice-weekly searches from May 1 to October 31, 2018, a total of 14 bird mortalities were documented within the search areas around the 10 turbines. Observed bird mortalities consisted entirely of landbird species, all of which are considered common in the province. Using appropriate correction factors, an estimated bird mortality rate of 2.96 birds/turbine/year (1.63 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, 2018, and once-weekly searches in November, four raptor mortalities were documented. All four mortalities were of turkey vulture (*Cathartes aura*), which is considered a common species in the province. This resulted in an estimated raptor mortality rate of 0.43 raptors/turbine/year or (0.24 raptors/MW/year). This is above the provincial threshold of 0.20 raptors/turbine/year.

During twice-weekly searches from May 1 to October 31, 2018, a total of 36 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*) and big brown bat (*Eptesicus fuscus*). Hoary bat is considered a long-distance migratory species which over-winters outside of Ontario, and accounted for 69% of the total bat mortality observations at the Gunn's Hill Wind Farm in 2018. Using appropriate correction factors, an estimated bat mortality rate of 9.05 bats/turbine/year (5.02 bats/MW/year) was determined for the Gunn's Hill Wind Farm. This is below 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 second 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, 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 2018 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 birds and bats.

The purpose of this report is to provide the detailed methods and results from the second 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 Inc. One HDI environmental monitor accompanied the NRSI biologist during each monitoring survey and assisted with the searches from May to October, and as a result, in each case they are referred to herein as a "search team", where applicable.

2.0 Mortality Monitoring Methodology

2.1 Mortality Monitoring

2.1.1 Sample Locations

For wind energy projects consisting of fewer 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 2018, 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, 2018. Raptor mortality monitoring was conducted by NRSI biologists once-weekly at all turbines throughout the month of November.

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 teams consisting of 2 searchers conducted each of the surveys from May 1 to October 31, this search time is equivalent to 40 minutes per turbine of total person-effort during each search event during the monitoring period.

On one occasion in the 2018 monitoring year, searches were conducted by only one searcher. In this instance, the search time was increased to 40 minutes per turbine to maintain a consistent amount of search effort.

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 five carcasses were placed at one time and no more than two carcasses were 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, as well as 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/search teams 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 three 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. The data sheet used for searcher efficiency trials can be seen in Appendix I.

In order to meet the understood intent of the MNRF guidelines (OMNR 2011a, OMNR 2011b) to limit searcher bias, NRSI has not physically marked carcasses at this project, as it could influence the results of the trial and alert the searcher/search team to an ongoing searcher efficiency trial. Instead, NRSI biologists collect detailed location information of the trial carcass with UTM coordinates, distance and direction from the turbine, and mapped location of the carcass. All collected carcasses are compared to these detailed location and species information to distinguish between trial carcasses and actual turbine mortalities. These steps have been taken to ensure that the location of the carcass, along with species information, is well documented for future reference if there is uncertainty about whether or not an observed carcass is a turbine-related fatality or a trial carcass.

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 2018 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 moderate throughout the monitoring seasons, with the lowest amount of scavenging activity documented during the spring trial. Table 1 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 1. Number of Carcasses Remaining During Scavenger Removal Trials at the Gunn's Hill WF (2018)

Number of Carcasses Remaining					
Spring Trial (May/June)					
Turbine	**Visit 0**	**Visit 1**	**Visit 2**	**Visit 3**	**Visit 4**
T01	1	0	0	0	0
T02	1	1	0	0	0
T03	1	1	1	1	0
T04	1	1	1	1	1
T05	1	1	0	0	0
T06	1	0	0	0	0
T07	1	0	0	0	0
T08	1	1	1	1	1
T09	1	1	1	0	0
T10	1	1	1	1	1
Total	**10**	**7**	**5**	**4**	**3**
Summer Trial (July/August)					
Turbine	**Visit 0**	**Visit 1**	**Visit 2**	**Visit 3**	**Visit 4**
T01	2	2	1	1	1
T02	2	0	0	0	0
T03	2	0	0	0	0
T05	3	2	2	2	2
T06	1	1	0	0	0
T07	2	0	0	0	0
T08	2	0	0	0	0
T09	2	0	0	0	0
T10	2	1	0	0	0
Total	**18**	**6**	**3**	**3**	**3**
Fall Trial (September/October)					
Turbine	**Visit 0**	**Visit 1**	**Visit 2**	**Visit 3**	**Visit 4**
T01	2	2	1	0	0
T03	1	0	0	0	0
T06	3	3	2	1	1
T08	1	0	0	0	0

Number of Carcasses Remaining					
T09	2	1	0	0	0
T10	1	1	0	0	0
Total	**10**	**7**	**3**	**1**	**1**

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

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

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:

Sc_{Spring} = (7 + 5 + 4 + 3) / (10 +7 + 5 + 4)
= 19 / 26
= **0.73**

Sc_{Summer} = (6 + 3 + 3 + 3) / (18 + 6 + 3 + 3)
= 15 / 30
= **0.50**

Sc_{Fall} = (7 + 3 + 1 + 1) / (10 + 7 + 3 + 1)
= 12 / 21
= **0.57**

The above scavenger removal rates represent the proportion of carcasses still remaining from one visit to the next. These scavenger values generally represent 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 relatively high throughout the 2018 monitoring season. Results of the monthly searcher efficiency trials are summarized in Table 2 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 2. Results of Searcher Efficiency Trials at the Gunn's Hill WF (2018)

Searcher	Carcasses Found	Carcasses Placed	Carcasses Scavenged	Searcher Efficiency (Se)	Proportion of Turbines Searched
May 2018					
Search Team A	9	10	0	0.90	1.00
June 2018					
Search Team A	8	11	1	0.80	1.00
July 2018					
Search Team A	7	10	0	0.70	0.89
Search Team C[1]	N/A	N/A	N/A	0.70	0.11
August 2018					
Search Team B[2]	8	9	0	0.89	0.33
Search Team A	9	11	0	0.82	0.67
September 2018					
Search Team A	8	10	0	0.80	0.88
Search Team D[1]	N/A	N/A	N/A	0.80	0.12
October 2018					
Search Team A	9	10	0	0.90	0.89
Searcher A[1]	N/A	N/A	N/A	0.90	0.11

[1]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. four search days are required for proper testing in one visibility class as no more than three 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.

[2]Search Team B was tested in August as it was anticipated they would be searching on four occasions. Following MNRF guidelines, no more than three carcasses were placed on a given date. Ultimately, however, this search team searched on only three dates, and as a result was only able to be tested with nine carcasses. It is expected that this result remains representative of the efficiency of the search team over their three search dates and as such, has been included.

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(proportion of turbines searched) + Se_B(proportion of turbines searched)…

SeO_{May} = 0.90 (1.00) = **0.90**
SeO_{June} = 0.80 (1.00) = **0.80**
SeO_{July} = 0.70 (0.89) + 0.70 (0.11) = **0.70**
SeO_{August} = 0.82 (0.67) + 0.89 (0.33) = **0.84**
$SeO_{September}$ = 0.80 (0.88) + 0.80 (0.12) = **0.80**
$SeO_{October}$ = 0.90 (0.89) + 0.90 (0.11) = **0.90**

These searcher efficiency values represent relatively 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 2018 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 3. The P_S values will be used to calculate the estimated avian, raptor, and bat mortality rates in Sections 6.0, 7.0, and 8.0 respectively.

Table 3. Proportion of Area Searched at the Gunn's Hill WF (2018)

Month	Total Searched Area (m^2)	Total Search Radius (m^2)	Proportion of Area Searched (P_S)
May	78,157	78,500	1.00
June	78,157	78,500	1.00
July	78,002	78,500	0.99
August	77,917	78,500	0.99
September	71,424	78,500	0.91
October	73,664	78,500	0.94

6.0 Avian Mortality Results

6.1 Avian Mortalities

During the 2018 mortality monitoring period at the Gunn's Hill WF, searchers found 14 bird mortalities within the 50m search radius of the turbines. This includes one live bird that was encountered while completing mortality monitoring surveys, but which was euthanized on site due to the severity of its injuries. The majority of the mortalities that could be identified to the species level were confirmed to be small landbirds, and all of the mortalities that could be identified to the species level represented common species for this area of the province. The most commonly observed mortalities were of horned lark (*Eremophila alpestris*) (n=5). Three bird mortalities could not be identified to the species level due to scavenging activity, but were identified either as passerine species or as a (non-raptor) bird 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 observed during the spring, summer, and fall monitoring periods. Mortality was highest in the months of June and July, with 4 mortalities observed in each month. The distribution of avian mortalities by month is shown in Figure 1 below.

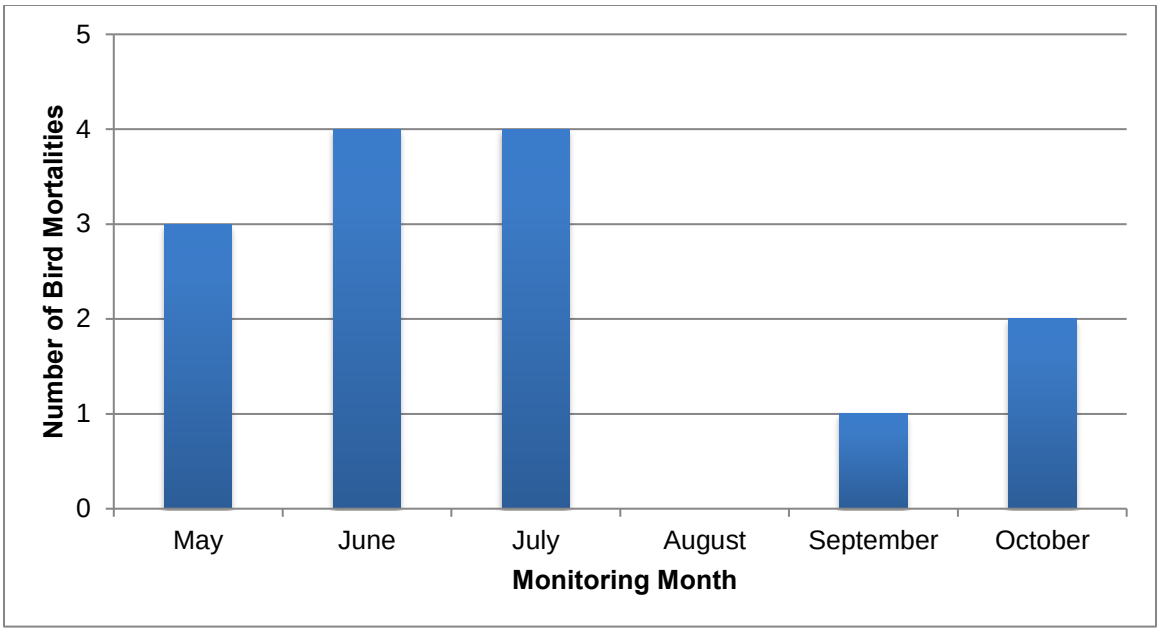


Figure 1. Bird Mortalities Observed by Month at the Gunn's Hill WF (2018)

6.3 Spatial Distribution of Avian Mortalities

Avian mortalities were observed at 6 of the 10 turbines (see Figure 2 below). The highest number of mortalities observed at a single turbine was 5, which occurred at turbine T08. Turbine maps identifying the location of each observed mortality have been provided in Appendix VI.

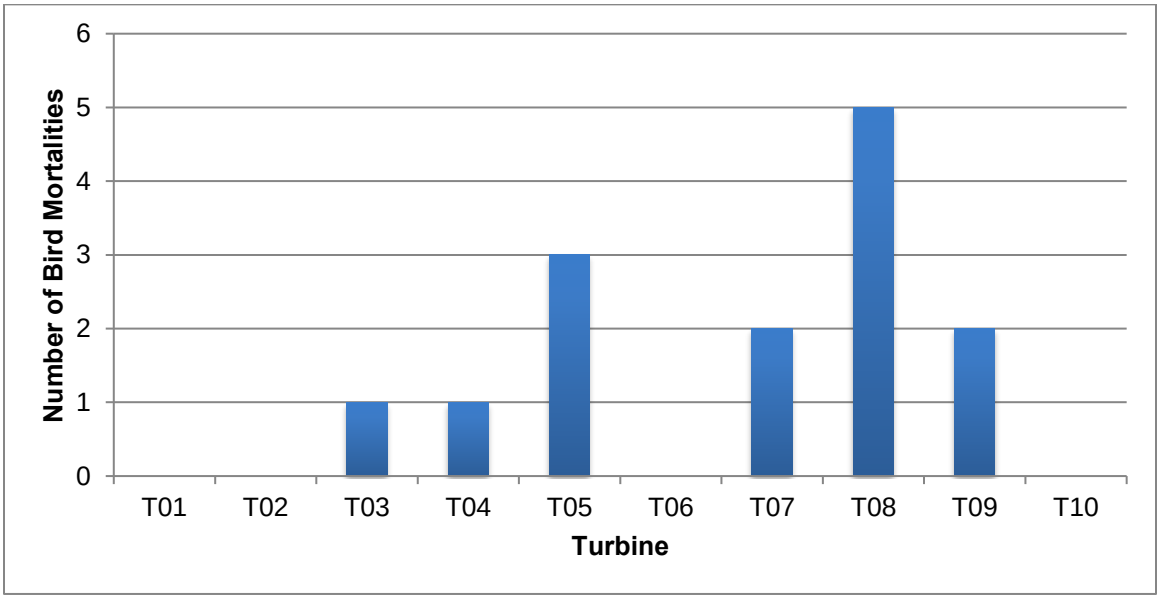


Figure 2. Bird Mortalities Observed by Turbine at the Gunn's Hill WF (2018)

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 2018. The equation recommended by the MNRF is found below:

$$\mathbf{C = c / (Se*Sc*P_S)}$$

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

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

C_{May} = 3 / (0.90*0.73*1.00) = 3 / 0.6570 = 4.57 birds
= 0.46 birds/turbine (0.25 birds/MW)

C_{June} = 4 / (0.80*0.73*1.00) = 4 / 0.5840 = 6.85 birds
= 0.69 birds/turbine (0.38 birds/MW)

C_{July} = 4 / (0.70*0.50*0.99) = 4 / 0.3465 = 11.54 birds
= 1.15 birds/turbine (0.64 birds/MW)

C_{August} = 0 / (0.84*0.50*0.99) = 0 / 0.4158 = 0.00 birds
= 0.00 birds/turbine (0.00 birds/MW)

$C_{September}$ = 1 / (0.80*0.57*0.91) = 1 / 0.4150 = 2.41 birds
= 0.24 birds/turbine (0.13 birds/MW)

$C_{October}$ = 2 / (0.90*0.57*0.94) = 2 / 0.4822 = 4.15 birds
= 0.42 birds/turbine (0.23 birds/MW)

6.5 Summary

A total of 14 avian mortalities were documented at the Gunn's Hill WF in 2018. Avian mortalities were found at 6 out of 10 turbines, ranging from 0 to 5 mortalities per turbine. Mortalities were observed during the spring, summer, and fall monitoring seasons, with the highest number of mortalities occurring during the months of June and July.

Using the appropriate variables and equations recommended by the MNRF, the corrected (estimated) avian mortality at the Gunn's Hill WF in 2018 was calculated. Table 4 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 4. Corrected Bird Mortality Rates Based on Mortality Monitoring at the Gunn's Hill WF (2018)

Month (2018)	Observed Avian Mortalities	Corrected Mortality (birds/turbine)	Corrected Mortality (birds/MW)
May	3	0.46	0.25
June	4	0.69	0.38
July	4	1.15	0.64
August	0	0.00	0.00
September	1	0.24	0.13
October	2	0.42	0.23
TOTAL	**14**	**2.96**	**1.63**

Based on the information collected during the 2018 post-construction monitoring period, the anticipated impact of this facility on birds is characterized by an estimated mortality rate of **2.96 birds/turbine/year** (1.63 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 4 raptor mortalities at the Gunn's Hill WF, consisting of 4 turkey vultures (*Cathartes aura*). Turkey vulture is not a tracked raptor species in Ontario (MNRF 2018).

Raptor mortalities were documented in August (n=1), September (n=2), and October (n=1), and were observed at 4 different turbines, including 1 at each of turbines T04, T05, T06, and T07.

Further details regarding raptor mortalities observed during the turbine searches are provided in Appendix IV, and turbine maps identifying the location of each observed 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 months of August, September, and October (when the observations occurred), the estimated raptor mortality rate is as follows:

C_{August} = 1 / (1.00*1.00*0.99) = 1 / 0.9900 = 1.01 raptors
= 0.10 raptors/turbine (0.06 raptors/MW)

$C_{September}$ = 2 / (1.00*1.00*0.91) = 2 / 0.9100 = 2.20 raptors
= 0.22 raptors/turbine (0.12 raptors/MW)

$C_{October}$ = 1 / (1.00*1.00*0.94) = 1 / 0.9400 = 1.06 raptors
= 0.11 raptors/turbine (0.06 raptors/MW)

Using the appropriate variables, the estimated raptor mortality at the Gunn's Hill WF is 4.27 raptors. This number corresponds to a value of **0.43 raptors/turbine/year** or 0.24 raptors/MW/year.

8.0 Bat Mortality Results

8.1 Bat Mortalities

During the 2018 post-construction mortality monitoring period at the Gunn's Hill WF, searchers observed 36 bat mortalities within the 50m search radius of the turbines. Bat mortalities represented two different species, including the long-distance migratory species hoary bat, and the resident species big brown bat (*Eptesicus fuscus*). The most abundant species observed was hoary bat (n=25), followed by big brown bat (n=11). Observed mortalities of long-distance migratory bat species (hoary bat) represent 69% of all documented mortalities.

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 June and mid-September, but were most abundantly observed during the months of July and August (92% of all bat mortalities; Figure 3). The monitoring day with the highest number of mortalities observed was August 10, 2018 (n=8).

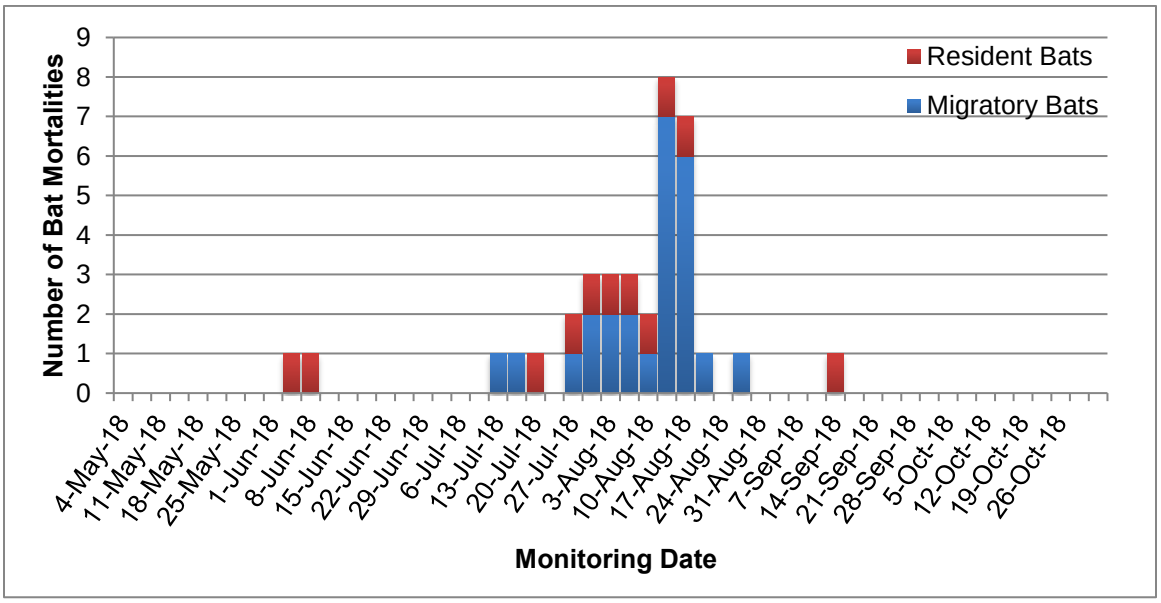


Figure 3. Bat Mortalities Observed by Date at the Gunn's Hill WF (2018)

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. Overall, bat mortality was concentrated during the months of July and August, corresponding to the anticipated peak periods of summer swarming and 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 2018 (see Figure 4 below). The number of mortalities observed at each turbine varied, ranging from one mortality at turbines T03 and T10 to seven mortalities at turbines T04 and T06.

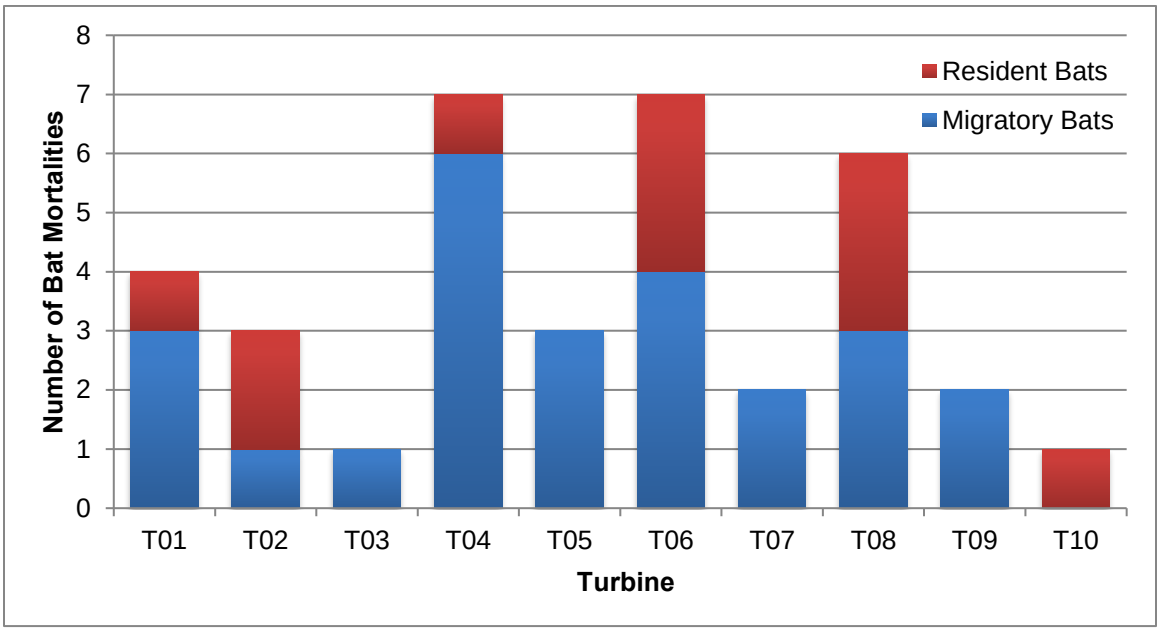


Figure 4. Bat Mortalities Observed by Turbine at the Gunn's Hill WF (2018)

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 5m to 50m from the turbine base, and averaging a distance of approximately 26m 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.

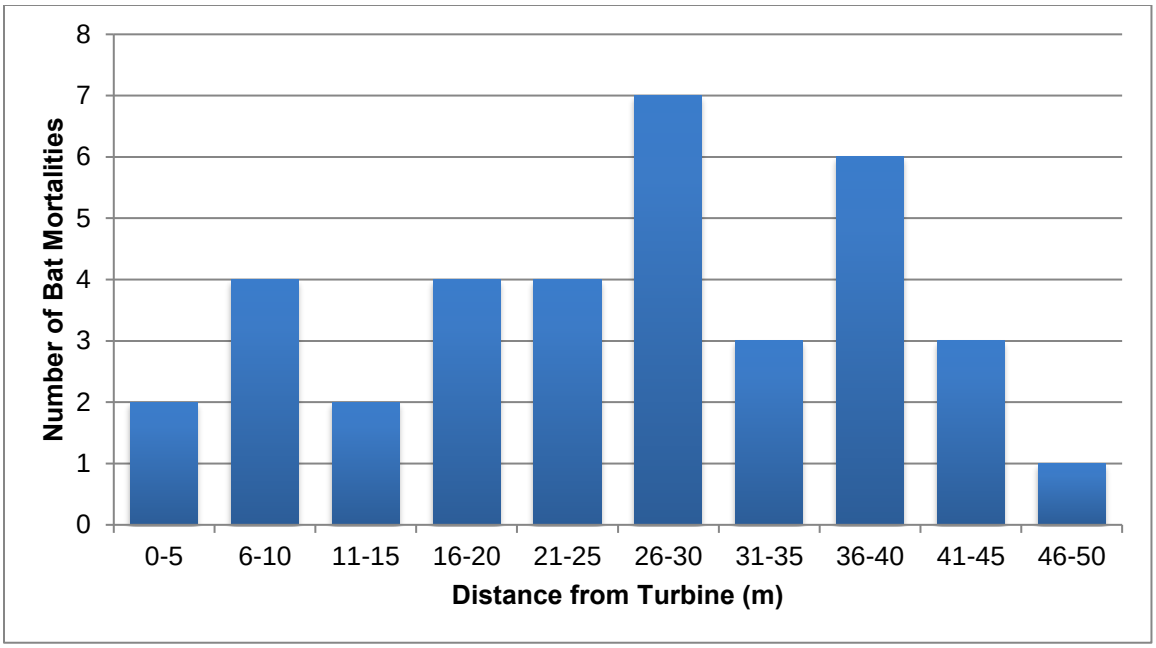


Figure 5. Bat Mortalities Observed by Distance from Turbine at the Gunn's Hill WF (2018)

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 2018. The equation recommended by the MNRF is found below:

$$\mathbf{C = c / (Se*Sc*P_S)}$$

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

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

C_{May} = 0 / (0.90*0.73*1.00) = 0 / 0.6570 = 0.00 bats
= **0.00 bats/turbine** (0.00 bats/MW)

C_{June} = 2 / (0.80*0.73*1.00) = 2 / 0.5840 = 3.42 bats
= **0.34 bats/turbine** (0.19 bats/MW)

C_{July} = 11 / (0.70*0.50*0.99) = 11 / 0.3465 = 31.75 bats
= **3.18 bats/turbine** (1.76 bats/MW)

C_{August} = 22 / (0.84*0.50*0.99) = 22 / 0.4158 = 52.91 bats
= **5.29 bats/turbine** (2.94 bats/MW)

$C_{September}$ = 1 / (0.80*0.57*0.91) = 1 / 0.4150 = 2.41 bats
= **0.24 bats/turbine** (0.13 bats/MW)

$C_{October}$ = 0 / (0.90*0.57*0.94) = 0 / 0.4822 = 0.00 bats
= **0.00 bats/turbine** (0.00 bats/MW)

8.5 Summary

A total of 36 bat mortalities were documented at the Gunn's Hill WF in 2018. Mortalities included one of Ontario's long-distance migratory bat species, hoary bat, which represented 69% 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 and August, when 92% of all bat mortalities occurred. Bat mortalities ranged from 1 to 7 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 2018. 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 5.

Table 5. Corrected Bat Mortality Rates Based on Mortality Monitoring at the Gunn's Hill WF (2018)

Month (2018)	Observed Bat Mortalities	Corrected Mortality (bats/turbine)	Corrected Mortality (bats/MW)
May	0	0.00	0.00
June	2	0.34	0.19
July	11	3.18	1.76
August	22	5.29	2.94
September	1	0.24	0.13
October	0	0.00	0.00
TOTAL	**36**	**9.05**	**5.02**

Based on the information collected during the 2018 post-construction monitoring period, the anticipated impact of this facility on bats is characterized by a corrected mortality rate of **9.05 bats/turbine/year** (5.02 bats/MW/year).

9.0 Comparative Annual Results

Mortality monitoring conducted by NRSI in 2018 represents the second year of post-construction monitoring conducted at the Gunn's Hill WF. The following section provides a comparison of the 2017 and 2018 post-construction mortality monitoring results.

9.1 Avian Mortality Results

Table 6 below provides an abbreviated summary of total bird mortalities, monitoring periods, and corrected (estimated) mortality rates for each of the 2 years of mortality monitoring conducted to-date at the Gunn's Hill WF.

Table 6. Comparative Results of Avian Mortality Monitoring Seasons (2017-2018)

Year	Total Mortalities	Monitoring Period	Corrected Mortality Rates	
			Birds/Turbine/Year	Birds/MW/Year
2017	7	May 1 – October 31	1.03	0.57
2018	14	May 1 – October 31	2.96	1.63

Further details of the 2018 avian mortality results can be found in Section 6.0 of this report.

9.2 Raptor Mortality Results

Table 7 below provides an abbreviated summary of total raptor mortalities, monitoring periods, and corrected (estimated) mortality rates for each of the 2 years of mortality monitoring conducted to-date at the Gunn's Hill WF.

Table 7. Comparative Results of Raptor Mortality Monitoring Seasons (2017-2018)

Year	Total Mortalities	Monitoring Period	Corrected Mortality Rates	
			Raptors/Turbine/Year	Raptors/MW/Year
2017	1	May 1 – November 30	0.10	0.06
2018	4	May 1 – November 30	0.43	0.24

Further details of the 2018 raptor mortality results can be found in Section 7.0 of this report.

9.3 Bat Mortality Results

Table 8 below provides an abbreviated summary of total bat mortalities, monitoring periods, and corrected (estimated) mortality rates for each of the 2 years of mortality monitoring conducted to-date at the Gunn's Hill WF.

Table 8. Comparative Results of Bat Mortality Monitoring Seasons (2017-2018)

Year	Total Mortalities	Monitoring Period	Estimated Mortality Rates	
			Bats/Turbine/Year	Bats/MW/Year
2017	68	May 1 – October 31	10.81	5.99
2018	36	May 1 – October 31	9.05	5.02

Further details of the 2018 bat mortality results can be found in Section 8.0 of this report.

9.4 Summary

Although a general comparison between the two years of post-construction monitoring data is possible, the differences in searcher efficiency rates, scavenger removal rates, and proportion area searched over these two monitoring years do not necessarily allow for a direct comparative analysis of observed mortalities between the two years. Local bird and bat abundance and behaviour will also change annually based on other variables, such as weather conditions, adjacent land uses, food availability, or general variations in population numbers, further adding to the challenges of making direct comparisons between monitoring years.

Despite these comparative challenges, general comparisons between the monitoring years have been made. Overall, a decrease in the number of bat mortalities, but an increase in the number of bird and raptor mortalities was observed in 2018, relative to the 2017 monitoring results.

10.0 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.

10.1 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 2.96 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.

10.2 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 0.43 raptors/turbine/year and no mortalities of provincially tracked raptors, 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.

10.3 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 9.05 bats/turbine/year, the Gunn's Hill WF remains below this threshold. Since the results are below the established threshold, no notification is required.

10.4 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 2018 monitoring year. As no significant bird mortality event occurred, no notification is required.

10.5 Species at Risk Mortality Event

Any Species at Risk (SAR; MECP 2018) 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). No provincially-listed SAR bird or bat mortalities were documented by NRSI biologists at the Gunn's Hill Wind Farm during post-construction mortality monitoring in 2018.

11.0 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 2018 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 14 avian mortalities were documented at the Gunn's Hill WF during the 2018 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 **2.96 birds/turbine/year** (1.63 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 total of 4 raptor mortalities were documented at the Gunn's Hill WF during the 2018 monitoring period. Based on the observed raptor mortalities, a corrected (estimated) raptor mortality rate of **0.43 raptors/turbine/year** (0.24 raptors/MW/year) has been determined for the Gunn's Hill WF. This raptor mortality rate exceeds the provincial threshold level of 0.20 raptors/turbine/year established by the MNRF guidelines.

A total of 36 bat mortalities were documented during the 2018 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 **9.05 bats/turbine/year** (5.02 bats/MW/year) has been determined for

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

12.0 References

Ministry of Natural Resources and Forestry (MNRF). 2018. 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 Environment, Conservation and Parks (MECP). 2018. Species at Risk in Ontario (SARO). Available at: https://www.ontario.ca/page/species-risk-ontario

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

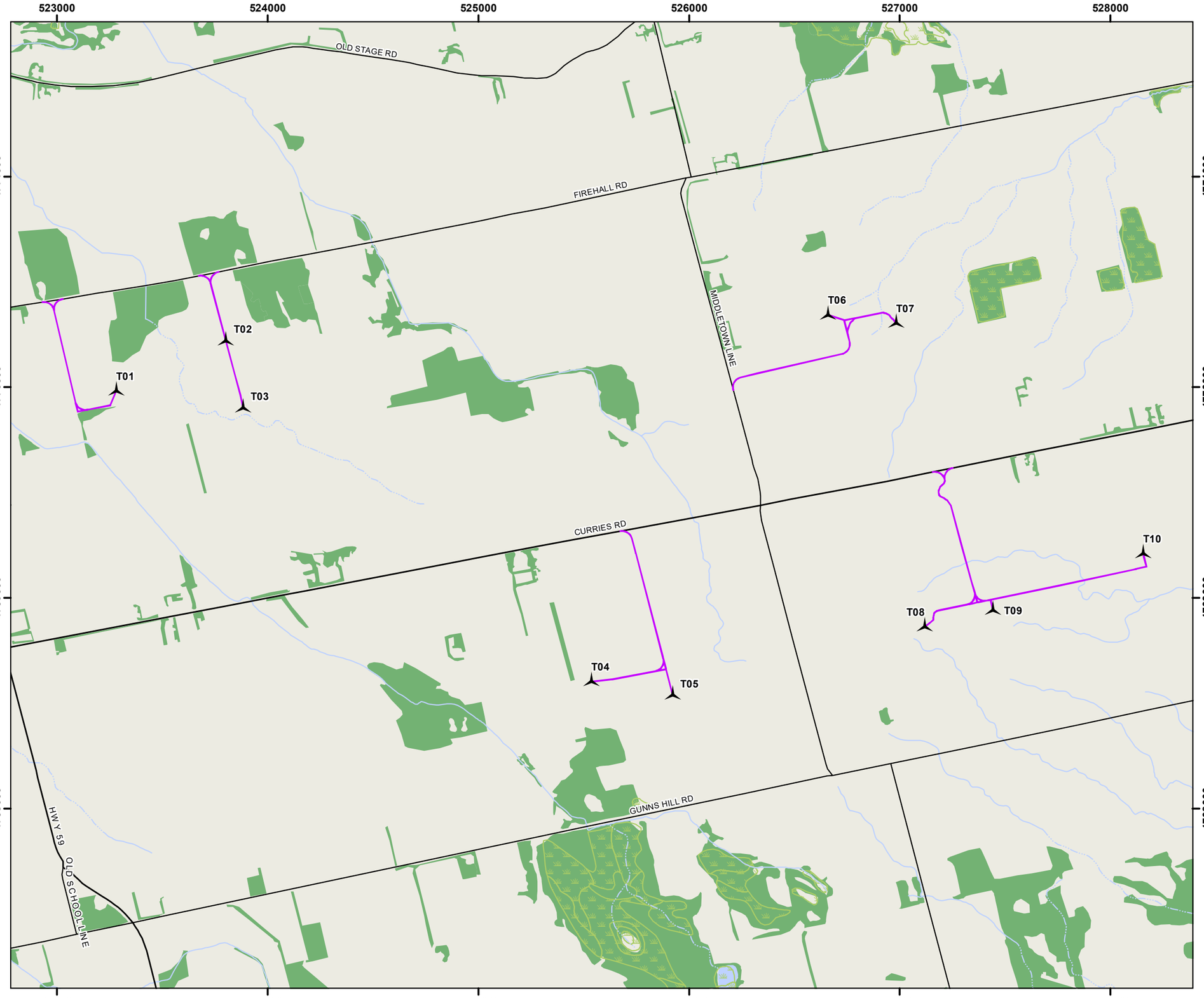
Map 1

Gunn's Hill Wind Farm

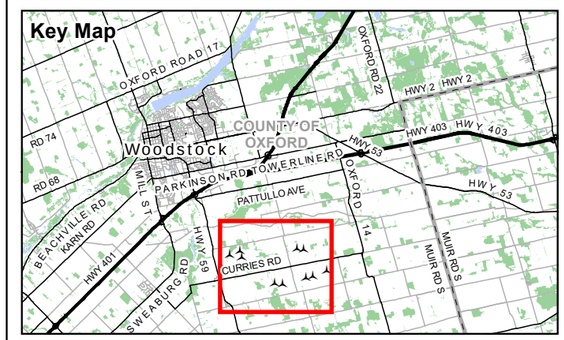
Project Area

Legend

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



Key Map



NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

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Project: 1875B
Date: January 16, 2019

NAD83 - UTM Zone 17
Size: 11x17"
1:18,000

0 200 400 600 800 1,000 Metres

N

Path: X:\1875_GunnsHillWindFarm\NRSI_1875A_Map1_ProjectArea_18K_2019_01_16_KEF.mxd

Appendix I
Post-construction Monitoring Data Sheets

Bird and Bat Mortality Search Summary

Date (dd/mm/yy): ____/____/____ Observer(s): _____ Project Name: _____ Project No: _____

Start Time (24hrs): _____hrs Dog Used? Y N Days Since Last Search (*i.e. Mon to Thurs = 3 days*): _____days

WEATHER

Temp: _____°C Cloud Cover: _____ % Wind Speed: _____ Wind Direction (from): _____ (use N,SW, etc.)

Visibility: High Medium Low Precip: None Rain Fog Weather Comments: _____

Significant Weather before visit?_____

COMMENTS (ex. wildlife notes, landowner interactions, turbine maintenance, unsearchable areas, etc.)

_____

_____

_____

_____

SEARCH RESULTS

Scheduled Search			Mortality Results. Enter "None" if no mortalities found.													
Turbine #	Start Time (24hr)	End Time (24hr)	Sample ID (PROJ#-DDMMYY-TXX-Mortality No.)	Species Found	Bat FA (mm)	Sex (M/F)	UTM		Dist. from Turbine (m)	Dir. from Turbine (°)	CC	Est. Time Since Death (hrs)	Injuries	Substrate/Habitat	VC	Photo No.(s)
							Easting	Northing								

CC = Condition Codes: I: Injured or Dying, F: Fresh, E: Early Decomposition, M: Moderate Decomposition, A: Advanced Decomposition, C: Complete Decomposition, S: Scavenged

Injuries: Describe any injuries to the bird carcass (e.g. none observed, broken neck, broken left wing, decapitated, laceration etc.)

Substrate/Habitat Types: The material upon which the carcass was found (ex. gravel, soy, corn, open soil, mud, standing water, concrete etc.)

VC = Visibility Class Codes: Class 1: >90% bare ground, <15cm tall Class 2: >25% bare ground, <15cm tall Class 3: < 25% bare ground, <25% >30cm tall Class 4: little or no bare ground, >25% >30cm tall

FA (mm) = Forearm Length (mm): Measure the length of the leading edge of the wing between the wrist and the elbow (mm)

Scavenger Removal Data Form

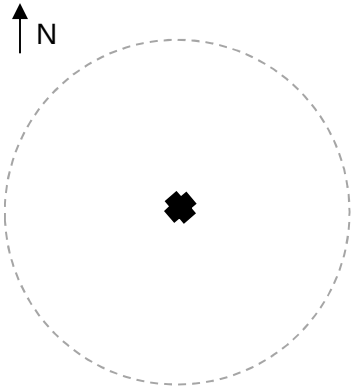
Project Name:_____ **Project #:** _____

Visit #	Day	Date	Obs.	Temp (°C)	Wind Speed	Wind Direction	Precip.	Visibility	Cloud Cover (%)	Cloud Height
0	0									
1										
2										
3										
4										

Turbine No. _____

Specimen 1: Species _____ Dist: _____ Dir: _____ UTM: _____
Visibility Class: _____ Notes:_____

Specimen 2: Species _____ Dist: _____ Dir: _____ UTM: _____
Visibility Class: _____ Notes:_____

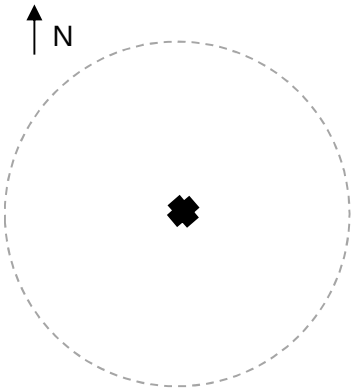


Day	Time	Specimen 1			Specimen 2		
		Present	Signs of Scavenging	Photo No.(s)	Present	Signs of Scavenging	Photo No.(s)

Turbine No. _____

Specimen 1: Species _____ Dist: _____ Dir: _____ UTM: _____
Visibility Class: _____ Notes:_____

Specimen 2: Species _____ Dist: _____ Dir: _____ UTM: _____
Visibility Class: _____ Notes:_____



Day	Time	Specimen 1			Specimen 2		
		Present	Signs of Scavenging	Photo No.(s)	Present	Signs of Scavenging	Photo No.(s)

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)

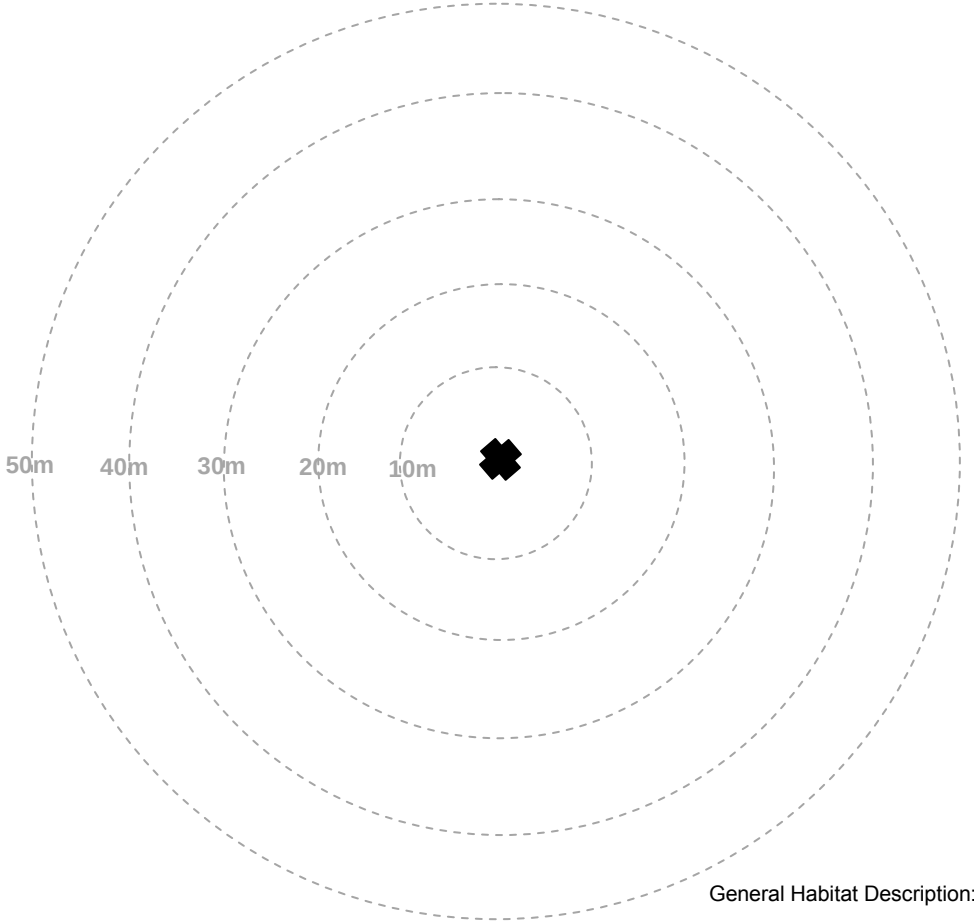
Photo Numbers (from turbine base)
Facing North: _____
Facing East: _____
Facing South: _____
Facing West: _____
(sketch habitat and visibility classes)

Date (DD/MM/YY): ___/____/____

Observer: _____

Monthly/Seasonal
Linear Transect Width: _____m

N



General Habitat Description:
_____

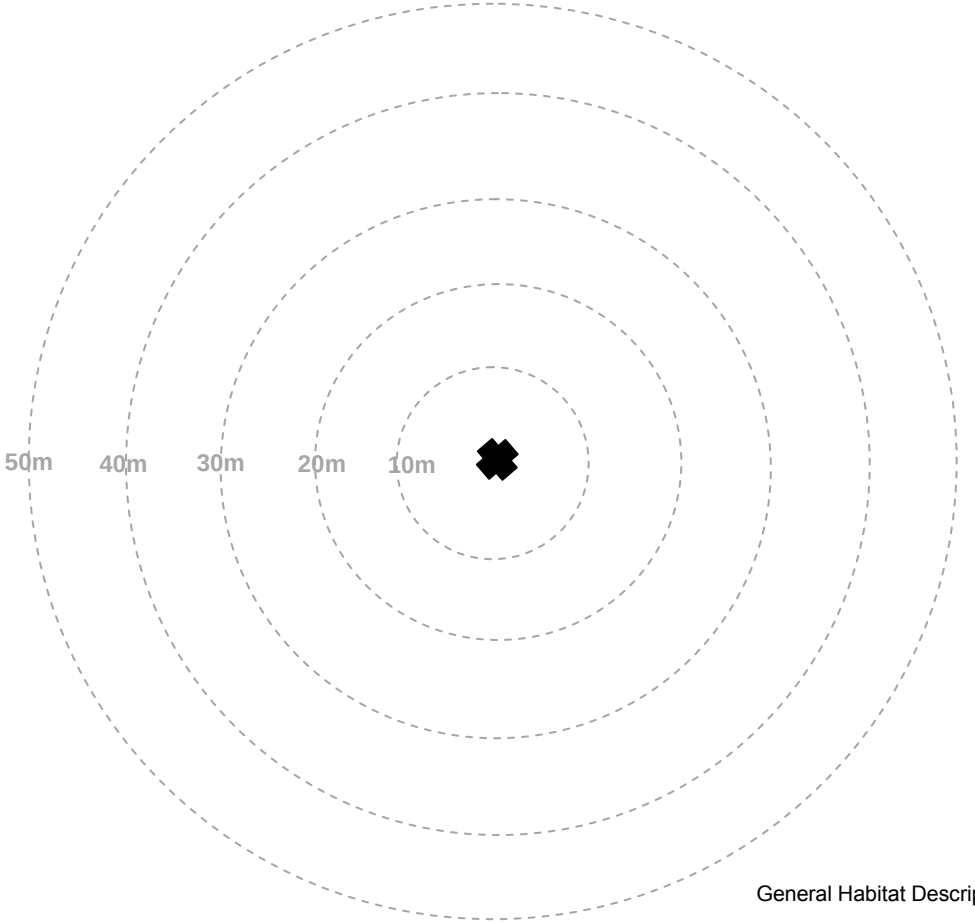
Photo Numbers (from turbine base)
Facing North: _____
Facing East: _____
Facing South: _____
Facing West: _____
(sketch habitat and visibility classes)

Date (DD/MM/YY): ___/____/____

Observer: _____

Monthly/Seasonal
Linear Transect Width: _____m

N



General Habitat Description:
_____

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

Appendix II
1875B Gunn's Hill Wind Farm
Scavenger Removal Trial Results 2018

Spring (May/June) 2018 Scavenger Removal Trial

Carcass Number	Turbine	Species	Distance from Turbine Base (m)	Direction from Turbine Base (°)	UTM (Zone 17T)		Visibility Class	Test Day	Date	Carcass Present	Signs of Scavenging	Tester
					Easting	Northing						
1	T01	Rock Pigeon	42	190	523280	4769838	1	Day 0	08-May-18	Y	Carcass placed	Search Team A
								Day 3	11-May-18	N	Carcass removed; some feathers remain	Search Team A
								Day 7	15-May-18	N	N/A	Search Team A
								Day 10	18-May-18	N	N/A	Search Team A
								Day 14	22-May-18	N	N/A	Search Team A
2	T02	Hoary Bat	27	356	523787	4770242	1	Day 0	08-May-18	Y	Carcass placed	Search Team A
								Day 3	11-May-18	Y	None	Search Team A
								Day 7	15-May-18	N	Carcass removed	Search Team A
								Day 10	18-May-18	N	N/A	Search Team A
								Day 14	22-May-18	N	N/A	Search Team A
3	T03	Silver-haired Bat	5	343	523882	4769902	1	Day 0	08-May-18	Y	Carcass placed	Search Team A
								Day 3	11-May-18	Y	None	Search Team A
								Day 7	15-May-18	Y	None	Search Team A
								Day 10	18-May-18	Y	None	Search Team A
								Day 14	22-May-18	N	Carcass removed	Search Team A
4	T04	Red-winged Blackbird	14	40	525542	4768611	1	Day 0	22-May-18	Y	Carcass placed	Search Team A
								Day 3	25-May-18	Y	None	Search Team A
								Day 7	29-May-18	Y	None	Search Team A
								Day 10	1-Jun-18	Y	None	Search Team A
								Day 14	5-Jun-18	Y	None	Search Team A
5	T05	Wilson's Warbler	31	56	525943	4768557	1	Day 0	22-May-18	Y	Carcass placed	Search Team A
								Day 3	25-May-18	Y	None	Search Team A
								Day 7	29-May-18	N	Carcass removed; some feathers remain	Search Team A
								Day 10	1-Jun-18	N	N/A	Search Team A
								Day 14	5-Jun-18	N	N/A	Search Team A
6	T06	Silver-haired Bat	45	111	526944	4770343	1	Day 0	01-Jun-18	Y	Carcass placed	Search Team A
								Day 4	05-Jun-18	N	Carcass removed	Search Team A
								Day 7	08-Jun-18	N	N/A	Search Team A
								Day 11	12-Jun-18	N	N/A	Search Team A
								Day 14	15-Jun-18	N	N/A	Search Team A
7	T07	Tennessee Warbler	25	3	526984	4770329	1	Day 0	01-Jun-18	Y	Carcass placed	Search Team A
								Day 4	05-Jun-18	N	Carcass removed; one feather remains	Search Team A
								Day 7	08-Jun-18	N	N/A	Search Team A
								Day 11	12-Jun-18	N	N/A	Search Team A
								Day 14	15-Jun-18	N	N/A	Search Team A
8	T08	Eastern Red Bat	13	99	527123	4768862	1	Day 0	01-Jun-18	Y	Carcass placed	Search Team A
								Day 4	05-Jun-18	Y	None	Search Team A
								Day 7	08-Jun-18	Y	None	Search Team A
								Day 11	12-Jun-18	Y	None	Search Team A
								Day 14	15-Jun-18	Y	None	Search Team A
9	T09	Golden-crowned Kinglet	37	290	527401	4768942	1	Day 0	01-Jun-18	Y	Carcass placed	Search Team A
								Day 4	05-Jun-18	Y	None	Search Team A
								Day 7	08-Jun-18	Y	None	Search Team A
								Day 11	12-Jun-18	N	Carcass removed; some feathers remain	Search Team A
								Day 14	15-Jun-18	N	N/A	Search Team A
10	T10	Hermit Thrush	5	50	528159	4769206	1	Day 0	05-Jun-18	Y	Carcass placed	Search Team A
								Day 3	08-Jun-18	Y	None	Search Team A
								Day 7	12-Jun-18	Y	None	Search Team A
								Day 10	15-Jun-18	Y	None	Search Team A
								Day 14	19-Jun-18	Y	Wing and abdomen scavenged	Search Team A

Summer (July/August) 2018 Scavenger Removal Trial

Carcass Number	Turbine	Species	Distance from Turbine Base (m)	Direction from Turbine Base (˚)	UTM (Zone 17T)		Visibility Class	Test Day	Date	Carcass Present	Signs of Scavenging	Tester
					Easting	Northing						
1	T01	Eastern Red Bat	47	266	523249	4769904	1	Day 0	06-Jul-18	Y	Carcass placed	Search Team A
								Day 4	10-Jul-18	Y	None	Search Team A
								Day 7	13-Jul-18	Y	None	Search Team C
								Day 11	17-Jul-18	Y	None	Search Team A
								Day 14	20-Jul-18	Y	None	Search Team A
2	T02	Hoary Bat	17	290	523776	4770215	1	Day 0	06-Jul-18	Y	Carcass placed	Search Team A
								Day 4	10-Jul-18	N	Carcass removed	Search Team A
								Day 7	13-Jul-18	N	N/A	Search Team C
								Day 11	17-Jul-18	N	N/A	Search Team A
								Day 14	20-Jul-18	N	N/A	Search Team A
3	T03	American Robin	29	76	523903	4769915	1	Day 0	06-Jul-18	Y	Carcass placed	Search Team A
								Day 4	10-Jul-18	N	Carcass removed	Search Team A
								Day 7	13-Jul-18	N	N/A	Search Team C
								Day 11	17-Jul-18	N	N/A	Search Team A
								Day 14	20-Jul-18	N	N/A	Search Team A
4	T06	American Goldfinch	14	180	526659	4770329	1	Day 0	06-Jul-18	Y	Carcass placed	Search Team A
								Day 4	10-Jul-18	Y	None	Search Team A
								Day 7	13-Jul-18	N	Carcass removed	Search Team C
								Day 11	17-Jul-18	N	N/A	Search Team A
								Day 14	20-Jul-18	N	N/A	Search Team A
5	T07	Eastern Red Bat	37	92	527018	4770306	1	Day 0	06-Jul-18	Y	Carcass placed	Search Team A
								Day 4	10-Jul-18	N	Carcass removed	Search Team A
								Day 7	13-Jul-18	N	N/A	Search Team C
								Day 11	17-Jul-18	N	N/A	Search Team A
								Day 14	20-Jul-18	N	N/A	Search Team A
6	T02	Eastern Red Bat	28	325	523773	4770234	1	Day 0	17-Jul-18	Y	Carcass placed	Search Team A
								Day 3	20-Jul-18	N	Carcass removed	Search Team A
								Day 7	24-Jul-18	N	N/A	Search Team A
								Day 10	27-Jul-18	N	N/A	Search Team A
								Day 14	31-Jul-18	N	N/A	Search Team A
7	T03	American Robin	20	134	523893	4769888	1	Day 0	17-Jul-18	Y	Carcass placed	Search Team A
								Day 3	20-Jul-18	N	Carcass removed; some feathers remain	Search Team A
								Day 7	24-Jul-18	N	N/A	Search Team A
								Day 10	27-Jul-18	N	N/A	Search Team A
								Day 14	31-Jul-18	N	N/A	Search Team A
8	T05	Silver-haired Bat	14	62	525928	4768540	1	Day 0	17-Jul-18	Y	Carcass placed	Search Team A
								Day 3	20-Jul-18	Y	None	Search Team A
								Day 7	24-Jul-18	Y	None	Search Team A
								Day 10	27-Jul-18	Y	None	Search Team A
								Day 14	31-Jul-18	Y	None	Search Team A
9	T10	Black-and-white Warbler	32	260	528122	4769194	1	Day 0	17-Jul-18	Y	Carcass placed	Search Team A
								Day 3	20-Jul-18	Y	Abdomen scavenged	Search Team A
								Day 7	24-Jul-18	N	Carcass removed	Search Team A
								Day 10	27-Jul-18	N	N/A	Search Team A
								Day 14	31-Jul-18	N	N/A	Search Team A
10	T01	Silver-haired Bat	47	0	523268	4770027	1	Day 0	03-Aug-18	Y	Carcass placed	Search Team A
								Day 4	07-Aug-18	Y	None	Search Team A
								Day 7	10-Aug-18	N	Carcass removed	Search Team B
								Day 11	14-Aug-18	N	N/A	Search Team B
								Day 14	17-Aug-18	N	N/A	Search Team B
11	T05	Ovenbird	39	106	525570	4768598	1	Day 0	03-Aug-18	Y	Carcass placed	Search Team A
								Day 4	07-Aug-18	Y	None	Search Team A
								Day 7	10-Aug-18	Y	None	Search Team B
								Day 11	14-Aug-18	Y	None	Search Team B
								Day 14	17-Aug-18	Y	None	Search Team B

12	T05	Red-eyed Vireo	23	214	525911	4768518	1	Day 0	03-Aug-18	Y	Carcass placed	Search Team A
								Day 4	07-Aug-18	N	Carcass removed	Search Team A
								Day 7	10-Aug-18	N	N/A	Search Team B
								Day 11	14-Aug-18	N	N/A	Search Team B
								Day 14	17-Aug-18	N	N/A	Search Team B
13	T08	White-crowned Sparrow	5	350	527109	4768518	1	Day 0	03-Aug-18	Y	Carcass placed	Search Team A
								Day 4	07-Aug-18	N	Carcass removed	Search Team A
								Day 7	10-Aug-18	N	N/A	Search Team B
								Day 11	14-Aug-18	N	N/A	Search Team B
								Day 14	17-Aug-18	N	N/A	Search Team B
14	T09	Hoary Bat	27	32	527448	4768873	1	Day 0	03-Aug-18	Y	Carcass placed	Search Team A
								Day 4	07-Aug-18	N	Carcass removed	Search Team A
								Day 7	10-Aug-18	N	N/A	Search Team B
								Day 11	14-Aug-18	N	N/A	Search Team B
								Day 14	17-Aug-18	N	N/A	Search Team B
15	T07	Hermit Thrush	32	189	526981	4770266	1	Day 0	17-Aug-18	Y	Carcass placed	Search Team B
								Day 4	21-Aug-18	N	Carcass removed	Search Team A
								Day 7	24-Aug-18	N	N/A	Search Team A
								Day 11	28-Aug-18	N	N/A	Search Team A
								Day 14	31-Aug-18	N	N/A	Search Team A
16	T08	Hoary Bat	24	122	527133	4768859	1	Day 0	17-Aug-18	Y	Carcass placed	Search Team B
								Day 4	21-Aug-18	N	Carcass removed	Search Team A
								Day 7	24-Aug-18	N	N/A	Search Team A
								Day 11	28-Aug-18	N	N/A	Search Team A
								Day 14	31-Aug-18	N	N/A	Search Team A
17	T09	Blackpoll Warbler	44	307	527396	4768960	1	Day 0	17-Aug-18	Y	Carcass placed	Search Team B
								Day 4	21-Aug-18	N	Carcass removed	Search Team A
								Day 7	24-Aug-18	N	N/A	Search Team A
								Day 11	28-Aug-18	N	N/A	Search Team A
								Day 14	31-Aug-18	N	N/A	Search Team A
18	T10	Hoary Bat	34	204	528146	4769170	1	Day 0	17-Aug-18	Y	Carcass placed	Search Team B
								Day 4	21-Aug-18	N	Carcass removed	Search Team A
								Day 7	24-Aug-18	N	N/A	Search Team A
								Day 11	28-Aug-18	N	N/A	Search Team A
								Day 14	31-Aug-18	N	N/A	Search Team A

Fall (September/October) 2018 Scavenger Removal Trial

Carcass Number	Turbine	Species	Distance from Turbine Base (m)	Direction from Turbine Base (˚)	UTM (Zone 17T)		Visibility Class	Test Day	Date	Carcass Present	Signs of Scavenging	Tester
					Easting	Northing						
1	T01	Hoary Bat	20	5	523273	4770011	1	0	07-Sep-18	Y	Carcass placed	Search Team D
								4	11-Sep-18	Y	None	Search Team A
								7	14-Sep-18	N	Carcass removed; turkey prints	Search Team A
								11	18-Sep-18	N	N/A	Search Team A
								14	21-Sep-18	N	N/A	Search Team A
2	T06	Black-and-white Warbler	14	236	526650	4770356	1	0	07-Sep-18	Y	Carcass placed	Search Team D
								4	11-Sep-18	Y	None	Search Team A
								7	14-Sep-18	N	Carcass removed; coyote prints	Search Team A
								11	18-Sep-18	N	N/A	Search Team A
								14	21-Sep-18	N	N/A	Search Team A
3	T06	Golden-crowned Kinglet	36	166	526660	4770314	1	0	07-Sep-18	Y	Carcass placed	Search Team D
								4	11-Sep-18	Y	Soil disturbance around carcass	Search Team A
								7	14-Sep-18	Y	No new signs	Search Team A
								11	18-Sep-18	N	Carcass removed	Search Team A
								14	21-Sep-18	N	N/A	Search Team A
4	T08	Silver-haied Bat	27	300	527087	4768879	1	0	07-Sep-18	Y	Carcass placed	Search Team D
								4	11-Sep-18	N	Carcass removed	Search Team A
								7	14-Sep-18	N	N/A	Search Team A
								11	18-Sep-18	N	N/A	Search Team A
								14	21-Sep-18	N	N/A	Search Team A
5	T09	Tennesse Warbler	38	344	527429	4768476	1	0	07-Sep-18	Y	Carcass placed	Search Team D
								4	11-Sep-18	Y	None	Search Team A
								7	14-Sep-18	N	Carcass removed	Search Team A
								11	18-Sep-18	N	N/A	Search Team A
								14	21-Sep-18	N	N/A	Search Team A
6	T01	Hoary Bat	22	200	523276	4769956	1	0	02-Oct-18	Y	Carcass placed	Search Team A
								3	05-Oct-18	Y	None	Search Team A
								7	09-Oct-18	Y	None	Search Team A
								10	12-Oct-18	N	Carcass removed; coyote prints	Searcher A
								14	16-Oct-18	N	N/A	Search Team A
7	T03	Hoary Bat	46	51	523911	4769935	1	0	02-Oct-18	Y	Carcass placed	Search Team A
								3	05-Oct-18	N	Carcass removed; coyote prints	Search Team A
								7	09-Oct-18	N	N/A	Search Team A
								10	12-Oct-18	N	N/A	Searcher A
								14	16-Oct-18	N	N/A	Search Team A
8	T06	White-crowned Sparrow	6	64	526660	4770339	1	0	02-Oct-18	Y	Carcass placed	Search Team A
								3	05-Oct-18	Y	None	Search Team A
								7	09-Oct-18	Y	None	Search Team A
								10	12-Oct-18	Y	None	Searcher A
								14	16-Oct-18	Y	None	Search Team A
9	T09	Hermit Thrush	47	324	527405	4768974	1	0	02-Oct-18	Y	Carcass placed	Search Team A
								3	05-Oct-18	N	Carcass removed	Search Team A
								7	09-Oct-18	N	N/A	Search Team A
								10	12-Oct-18	N	N/A	Searcher A
								14	16-Oct-18	N	N/A	Search Team A
10	T10	Silver-haired Bat	18	160	528161	4769188	1	0	02-Oct-18	Y	Carcass placed	Search Team A
								3	05-Oct-18	Y	None	Search Team A
								7	09-Oct-18	N	Carcass removed	Search Team A
								10	12-Oct-18	N	N/A	Searcher A
								14	16-Oct-18	N	N/A	Search Team A

Appendix III
Searcher Efficiency Trial Results

Appendix III
1875B Gunn's Hill Wind Farm
Searcher Efficiency Trial Results 2018

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
11-May-18	Search Team A	1	T08	Hoary Bat	26	20	Bare soil	1	527112	4768892	Y	-
		2	T09	Silver-haired Bat	46	40	Bare soil	1	527457	4768983	Y	-
		3	T10	Nashville Warbler	15	340	Bare soil	1	528140	4769219	Y	-
18-May-18	Search Team A	4	T01	Hoary Bat	41	155	Bare soil	1	523296	4769942	Y	-
		5	T02	Eastern Red Bat	11	35	Gravel	1	523803	4770225	N	N
		6	T03	Black-billed Cuckoo	21	300	Bare soil	1	523856	4769906	Y	-
22-May-18	Search Team A	7	T06	Brown Creeper	14	350	Bare soil	1	526657	4770353	Y	-
		8	T07	Black-and-white Warbler	29	115	Bare soil	1	527007	4770289	Y	-
25-May-18	Search Team A	9	T09	American Robin	39	80	Bare soil	1	527476	4768948	Y	-
		10	T10	Yellow Warbler	25	250	Bare soil	1	528131	4769192	Y	-

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
5-Jun-18	Search Team A	1	T01	Silver-haired Bat	30	129	Bare soil	1	523311	4769983	N	N
		2	T04	Hermit Thrush	15	260	Bare soil	1	525503	4768591	Y	-
		3	T05	Black-and-white Warbler	43	338	Bare soil	1	525909	4768563	Y	-
8-Jun-18	Search Team A	4	T06	Red-eyed Vireo	42	230	Bare soil	1	526627	4770300	Y	-
		5	T07	Song Sparrow	17	297	Bare soil	1	526963	4770301	N	N
		6	T08	Eastern Red Bat	33	179	Bare soil	1	527102	4768837	Y	-
22-Jun-18	Search Team A	7	T06	Swainson's Thrush	42	135	Bare soil	1	526686	4770309	Y	-
		8	T09	Magnolia Warbler	25	270	Bare soil	1	527411	4768933	N	Y
		9	T10	Hoary Bat	35	38	Bare soil	1	528174	4769179	Y	-
26-Jun-18	Search Team A	10	T05	Eastern Red Bat	10	28	Bare soil	1	525954	4768531	Y	-
		11	T08	American Robin	20	280	Bare soil	1	527091	4768866	Y	-

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
6-Jul-18	Search Team A	1	T06	Red-eyed Vireo	27	195	Bare soil	1	526654	4770313	N	N
		2	T07	Hoary Bat	43	85	Bare soil	1	527025	4770308	Y	-
		3	T09	House Sparrow	11	200	Bare soil	1	527438	4768928	Y	-
17-Jul-18	Search Team A	4	T01	American Robin	10	245	Gravel	1	523269	4769972	Y	-
		5	T04	Silver-haired Bat	24	359	Bare soil	1	525525	4768627	Y	-
		6	T05	Tennessee Warbler	46	30	Bare soil	1	525936	4768584	N	N
20-Jul-18	Search Team A	7	T08	Black-throated Green Warbler	42	180	Bare soil	1	527150	4768861	Y	-
		8	T09	Eastern Red Bat	34	200	Bare soil	1	527444	4768906	N	N
		9	T10	Wilson's Warbler	14	45	Bare soil	1	528165	4769219	Y	-
24-Jul-18	Search Team A	10	T01	Hoary Bat	34	280	Bare soil	1	523244	4769981	Y	-

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
10-Aug-18	Search Team B	1	T05	Hoary Bat	5	326	Bare soil	1	525915	4768550	Y	-
		2	T06	Red-breasted Nuthatch	45	55	Bare soil	1	526642	4770384	Y	-
		3	T07	Black-throated Blue Warbler	25	141	Bare soil	1	526998	4770283	Y	-
14-Aug-18	Search Team B	4	T04	White-throated Sparrow	40	120	Bare soil	1	525571	4769226	Y	-
		5	T05	Yellow Warbler	15	93	Bare soil	1	525934	4768536	Y	-
		6	T10	Hoary Bat	22	13	Bare soil	1	528155	4769226	Y	-
17-Aug-18	Search Team B	7	T02	Wilson's Warbler	10	220	Gravel	1	523795	4770203	N	N
		8	T03	Hoary Bat	49	330	Bare soil	1	523850	4769940	Y	-
		9	T07	Hermit Thrush	32	170	Bare soil	1	526981	4770266	Y	-

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
21-Aug-18	Search Team A	1	T01	Nashville Warbler	47	219	Bare soil	1	523254	4769938	Y	-
		2	T06	Silver-haired Bat	12	300	Bare soil	1	526644	4770347	Y	-
		3	T09	Ovenbird	20	180	Bare soil	1	527441	4768912	Y	-
24-Aug-18	Search Team A	4	T05	Silver-haired bat	42	220	Bare soil	1	525898	4768499	N	N
		5	T09	Yellow-bellied Sapsucker	14	40	Bare soil	1	527435	4768960	Y	-
		6	T10	Black-throated Green Warbler	25	310	Bare soil	1	528126	4769201	Y	-
28-Aug-18	Search Team A	7	T04	White-throated Sparrow	39	211	Bare soil	1	525527	4768859	Y	-
		8	T07	Black-and-white Warbler	28	345	Gravel	1	526962	4768563	N	N
		9	T08	Eastern Red Bat	10	140	Bare soil	1	527117	4768499	Y	-
31-Aug-18	Search Team A	10	T02	Hoary Bat	20	310	Bare soil	1	523785	4770236	Y	-
		11	T03	Hoary Bat	14	25	Gravel	1	523887	4769913	Y	-

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
14-Sep-18	Search Team A	1	T08	Tennesee Warbler	39	120	Bare soil	1	527135	4768857	Y	-
		2	T09	Ovenbird	20	300	Bare soil	1	527417	4768946	Y	-
		3	T10	Eastern Red Bat	6	20	Gravel	1	528153	4769214	N	N
18-Sep-18	Search Team A	4	T01	White-throated Sparrow	13	300	Bare soil	1	523262	4769988	N	N
		5	T02	Ovenbird	48	140	Bare soil	1	523833	4770184	Y	-
		6	T03	Silver-haired Bat	7	330	Bare soil	1	523869	4769906	Y	-
21-Sep-18	Search Team A	7	T06	Bay-breasted Warbler	32	320	Bare soil	1	526628	4770362	Y	-
		8	T07	Eastern Red Bat	40	10	Bare soil	1	526979	4770342	Y	-
24-Sep-18	Search Team A	9	T04	Silver-haired Bat	48	45	Bare soil	1	525563	4768624	Y	-
		10	T05	Ovenbird	24	80	Bare soil	1	525940	4768550	Y	-

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
9-Oct-18	Search Team A	1	T08	Silver-haired Bat	2	135	Gravel	1	525571	4768603	Y	-
		2	T09	Chestnut-sided Warbler	30	240	Bare soil	1	527419	4768914	Y	-
		3	T10	Silver-haired Bat	12	290	Bare soil	1	528138	4769203	Y	-
16-Oct-18	Search Team A	4	T06	Mourning Warbler	10	320	Bare soil	1	526650	4770353	N	N
		5	T07	Ovenbird	46	75	Bare soil	1	527024	4770321	Y	-
23-Oct-18	Search Team A	6	T01	Hoary Bat	44	250	Bare soil	1	523239	4769962	Y	-
		7	T04	Silver-haired Bat	33	60	Bare soil	1	525554	4768632	Y	-
		8	T08	White-throated Sparrow	23	340	Bare soil	1	527101	4768891	Y	-
26-Oct-18	Search Team A	9	T02	Chestnut-sided Warbler	32	110	Bare soil	1	523829	4770213	Y	-
		10	T03	Mourning Warbler	17	220	Bare soil	1	523871	4769886	Y	-

Appendix IV
Avian Mortalities

Appendix IV
1875B Gunn's Hill WF
2018 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
1-May-18	T08	11:35	11:55	N	-	10-12	50	None	4	W	Golden-crowned Kinglet	1875-010518-T08-01	M	527162	4768856	45	100	F	24	None apparent	Bare soil	1
1-May-18	T08	11:35	11:55	N	-	10-12	50	None	4	W	Golden-crowned Kinglet	1875-010518-T08-02	M	527150	4768853	35	110	E	36	None apparent	Bare soil	1
8-May-18	T05	11:08	11:28	N	4	12	5	None	2	W	Horned Lark	1875-080518-T05-01	M	525947	4768575	41	223	F	24	None apparent	Bare soil	1
1-Jun-18	T05	11:28	11:48	N	3	19	60	None	3	SW	Horned Lark	1875-010618-T05-01	M	525931	4768515	24	164	M	48	Back laceration; tail removed	Bare soil	1
8-Jun-18	T05	11:17	11:37	N	3	16	90	None	4	E	Horned Lark	1875-080618-T05-01	M	525885	4768522	33	259	E	48	Back laceration	Bare soil	1
12-Jun-18	T07	10:00	10:20	N	4	18	10	None	5	S	Passerine species	1875-120618-T07-01	U	527025	4770304	42	85	S	-	Only feathers remaining	Bare soil	1
15-Jun-18	T03	9:26	9:46	N	3	16	5	None	2-3	S	Horned Lark	1875-150618-T03-01	M	523857	4769933	40	336	E	48	None apparent	Bare soil	1
3-Jul-18	T08	11:35	11:55	N	4	18	10	None	3	SE	Bird species	1875-030718-T08-01	U	527073	4768878	42	295	S	-	Only feathers remaining	Bare soil	1
13-Jul-18	T07	10:16	10:36	N	3	27	10	None	1	W	Cliff Swallow	1875-130718-T07-01	U	526974	4770344	41	0	E	48	Decapitated	Bare soil	1
17-Jul-18	T09	12:08	12:28	N	4	19	25	None	3-4	N	Passerine species	1875-170718-T09-01	U	527405	4768966	44	300	S	-	Only feathers remaining	Bare soil	1
31-Jul-18	T08	11:30	11:50	N	4	18	95	Fog	2-3	E	Cliff Swallow	1875-310718-T08-03	U	527076	4768843	46	240	F	24	None apparent	Bare soil	1
4-Sep-18	T04	10:40	11:00	N	4	22	35	Fog	4	E	Horned Lark	1875-040918-T04-01	F	525548	4768629	26	40	I	0	Bird was euthanized on site due to the severity of its injuries	Bare soil	1
2-Oct-18	T09	11:50	12:10	N	4	14	100	Rain/Fog	4	N	Magnolia Warbler	1875-021018-T09-01	U	527451	4768895	47	174	E	48	Neck laceration	Bare soil	1
23-Oct-18	T08	11:48	12:08	N	4	3	95	None	2-3	NW	Golden-crowned Kinglet	1875-231018-T08-01	M	527130	4768831	42	168	F	24	None apparent	Bare soil	1

2018 Raptor Mortalities

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
31-Aug-18	T05	11:09	11:29	N	3	14	25	Fog	2	E	Turkey Vulture	1875-310818-T05-01	U	525921	4768515	21	184	E	24	Back injury	Bare soil	1
14-Sep-18	T06	10:30	10:50	N	3	18	70	None	2-3	S	Turkey Vulture	1875-140918-T06-01	U	526674	4770371	31	38	F	24	Back injury	Bare soil	1
18-Sep-18	T07	9:55	10:15	N	4	18	100	Rain	1-2	N	Turkey Vulture	1875-180918-T07-01	U	526951	4770307	28	296	F	24	Back injury	Bare soil	1
9-Oct-18	T04	10:42	11:02	N	4	19	60	None	4-5	SW	Turkey Vulture	1875-091018-T04-01	U	525511	4768567	41	213	F	24	Bottom half of carcass missing	Bare soil	1

Appendix V
Bat Mortalities

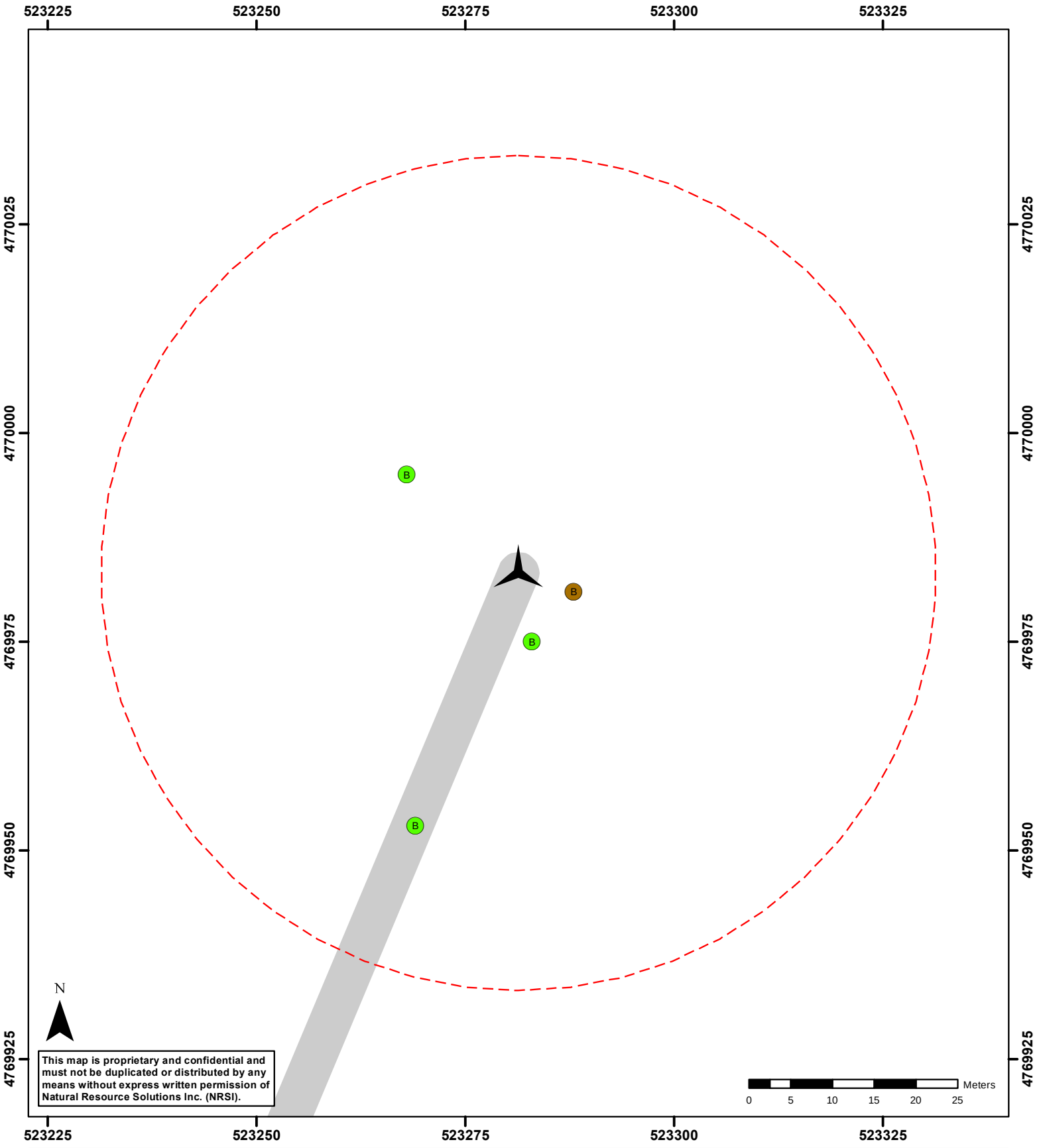
Appendix V
1875B Gunn's Hill WF
2018 Bat Mortalities

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
1-Jun-18	T02	9:05	9:25	N	3	19	60	None	3	SW	Big Brown Bat	1875-010618-T02-01	46	U	523802	4770223	12	45	A	108	None apparent	Gravel	1
5-Jun-18	T08	11:29	11:49	N	4	15	20	None	5-6	W	Big Brown Bat	1875-050618-T08-01	42	U	527079	4768874	30	296	M	60	Broken right wing	Bare soil	1
10-Jul-18	T04	10:56	11:16	N	4	21	75	None	3	W	Hoary Bat	1875-100718-T04-01	57	U	525500	4768581	41	240	E	36	None apparent	Bare soil	1
13-Jul-18	T04	11:40	12:00	N	3	27	10	None	1	W	Hoary Bat	1875-130718-T04-01	56	F	525536	4768629	25	10	F	12	None apparent	Bare soil	1
17-Jul-18	T01	8:30	8:50	N	4	19	25	None	3-4	N	Big Brown Bat	1875-170718-T01-01	45	U	523288	4769981	8	50	E	36	None apparent	Gravel	1
24-Jul-18	T06	10:20	10:40	N	4	18	90	Rain/Fog	4	SSE	Big Brown Bat	1875-240718-T06-01	47	U	526626	4770353	32	310	F	12	None apparent	Bare soil	1
24-Jul-18	T09	12:20	12:40	N	4	18	90	Rain/Fog	4	SSE	Hoary Bat	1875-240718-T09-01	54	U	527433	4768972	30	0	E	36	Chest injury; broken left wing	Gravel	1
27-Jul-18	T08	11:05	11:25	N	3	17	35	None	3-4	W	Hoary Bat	1875-270718-T08-01	53	U	527132	4768901	33	42	F	12	Broken right forearm	Bare soil	1
27-Jul-18	T08	11:05	11:25	N	3	17	35	None	3-4	W	Hoary Bat	1875-270718-T08-02	53	U	527112	4768892	26	4	E	36	Broken right forearm	Bare soil	1
27-Jul-18	T08	11:05	11:25	N	3	17	35	None	3-4	W	Big Brown Bat	1875-270718-T08-03	45	M	527107	4768841	26	198	E	36	Back injury	Bare soil	1
31-Jul-18	T06	10:07	10:27	N	4	18	95	Fog	2-3	E	Hoary Bat	1875-310718-T06-01	56	U	526649	4770379	36	5	F	12	None apparent	Bare soil	1
31-Jul-18	T08	11:30	11:50	N	4	18	95	Fog	2-3	E	Big Brown Bat	1875-310718-T08-01	47	U	527140	4768867	26	108	F	12	None apparent	Bare soil	1
31-Jul-18	T08	11:30	11:50	N	4	18	95	Fog	2-3	E	Hoary Bat	1875-310718-T08-02	54	F	527113	4768889	17	0	F	12	None apparent	Bare soil	1
3-Aug-18	T01	8:30	8:50	N	3	19	85	Fog	2	NW	Hoary Bat	1875-030818-T01-01	56	U	523268	4769995	17	330	F	12	Broken left wing	Bare soil	1
3-Aug-18	T07	10:07	10:27	N	3	19	85	Fog	2	NW	Hoary Bat	1875-030818-T07-01	53	U	527015	4770325	40	61	F	12	None apparent	Bare soil	1
3-Aug-18	T06	10:38	10:58	N	3	19	85	Fog	2	NW	Big Brown Bat	1875-030818-T06-01	44	U	526665	4770353	13	32	F	12	None apparent	Bare soil	1
7-Aug-18	T04	10:48	11:08	N	4	22	100	Fog	1-2	NW	Hoary Bat	1875-070818-T04-01	54	U	525547	4768582	23	162	E	36	Broken left and right forarm	Bare soil	1
7-Aug-18	T04	10:48	11:08	N	4	22	100	Fog	1-2	NW	Big Brown Bat	1875-070818-T04-02	45	U	525536	4768562	40	181	A	84	Decapitated; broken left forarm	Bare soil	1
10-Aug-18	T01	8:30	8:50	N	3	18	75	Fog	3-4	NE	Hoary Bat	1875-100818-T01-01	54	U	523269	4769953	26	216	F	12	None apparent	Gravel	1
10-Aug-18	T03	9:17	9:37	N	3	18	75	Fog	3-4	NE	Hoary Bat	1875-100818-T03-01	55	U	523882	4769895	7	91	F	12	None apparent	Gravel	1
10-Aug-18	T06	10:20	10:40	N	3	18	75	Fog	3-4	NE	Hoary Bat	1875-100818-T06-01	56	U	526658	4770299	41	191	E	36	Broken left forarm	Bare soil	1
10-Aug-18	T06	10:20	10:40	N	3	18	75	Fog	3-4	NE	Hoary Bat	1875-100818-T06-02	55	U	526656	4770362	20	8	M	60	None apparent	Bare soil	1
10-Aug-18	T04	11:00	11:20	N	3	18	75	Fog	3-4	NE	Hoary Bat	1875-100818-T04-01	54	U	525580	4768598	45	116	A	108	None apparent	Bare soil	1
10-Aug-18	T04	11:00	11:20	N	3	18	75	Fog	3-4	NE	Hoary Bat	1875-100818-T04-02	55	U	525549	4768620	22	40	A	108	None apparent	Bare soil	1
10-Aug-18	T05	11:37	11:57	N	3	18	75	Fog	3-4	NE	Hoary Bat	1875-100818-T05-01	60	U	525954	4768555	39	76	M	60	None apparent	Bare soil	1
10-Aug-18	T10	13:00	13:20	N	3	18	75	Fog	3-4	NE	Big Brown Bat	1875-100818-T10-01	45	U	528160	4769204	5	42	F	12	Back injury	Gravel	1
14-Aug-18	T01	8:30	8:50	N	4	20	55	None	2	NNW	Hoary Bat	1875-140818-T01-01	56	U	523283	4769975	5	169	F	12	None apparent	Gravel	1
14-Aug-18	T06	9:50	10:10	N	4	20	55	None	2	NNW	Hoary Bat	1875-140818-T06-01	55	U	526629	4770384	50	322	E	36	Broken right wing	Gravel	1
14-Aug-18	T06	9:50	10:10	N	4	20	55	None	2	NNW	Big Brown Bat	1875-140818-T06-02	45	U	526656	4770376	32	353	F	12	None apparent	Bare soil	1
14-Aug-18	T07	10:20	10:40	N	4	20	55	None	2	NNW	Hoary Bat	1875-140818-T07-01	56	U	526981	4770312	7	339	F	12	Broken left wing	Gravel	1
14-Aug-18	T04	10:55	11:15	N	4	20	55	None	2	NNW	Hoary Bat	1875-140818-T04-01	55	U	525514	4768578	28	232	E	36	None apparent	Bare soil	1
14-Aug-18	T05	11:30	11:50	N	4	20	55	None	2	NNW	Hoary Bat	1875-140818-T05-01	54	U	525917	4768547	10	350	F	12	Left shoulder injury	Gravel	1
14-Aug-18	T09	12:23	12:43	N	4	20	55	None	2	NNW	Hoary Bat	1875-140818-T09-01	55	U	527422	4768923	21	242	F	12	None apparent	Bare soil	1
17-Aug-18	T05	10:58	11:18	N	3	22	100	Rain/Fog	3	W	Hoary Bat	1875-170818-T05-01	55	U	525957	4768547	37	84	F	12	None apparent	Bare soil	1
24-Aug-18	T02	8:58	9:18	N	3	13	30	Fog	1-2	W	Hoary Bat	1875-240818-T02-01	57	U	523814	4770221	20	79	F	12	Broken left wing	Gravel	1
11-Sep-18	T02	9:00	9:20	N	4	13	100	Rain/Fog	4	N	Big Brown Bat	1875-110918-T02-01	44	U	523763	4770210	40	252	F	12	None apparent	Bare soil	1

Appendix VI
Locations of Bird and Bat Mortalities



Legend

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

Appendix VI

Gunn's Hill WF

Turbine 01 Mortalities 2018

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2019 Project: 1875B

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

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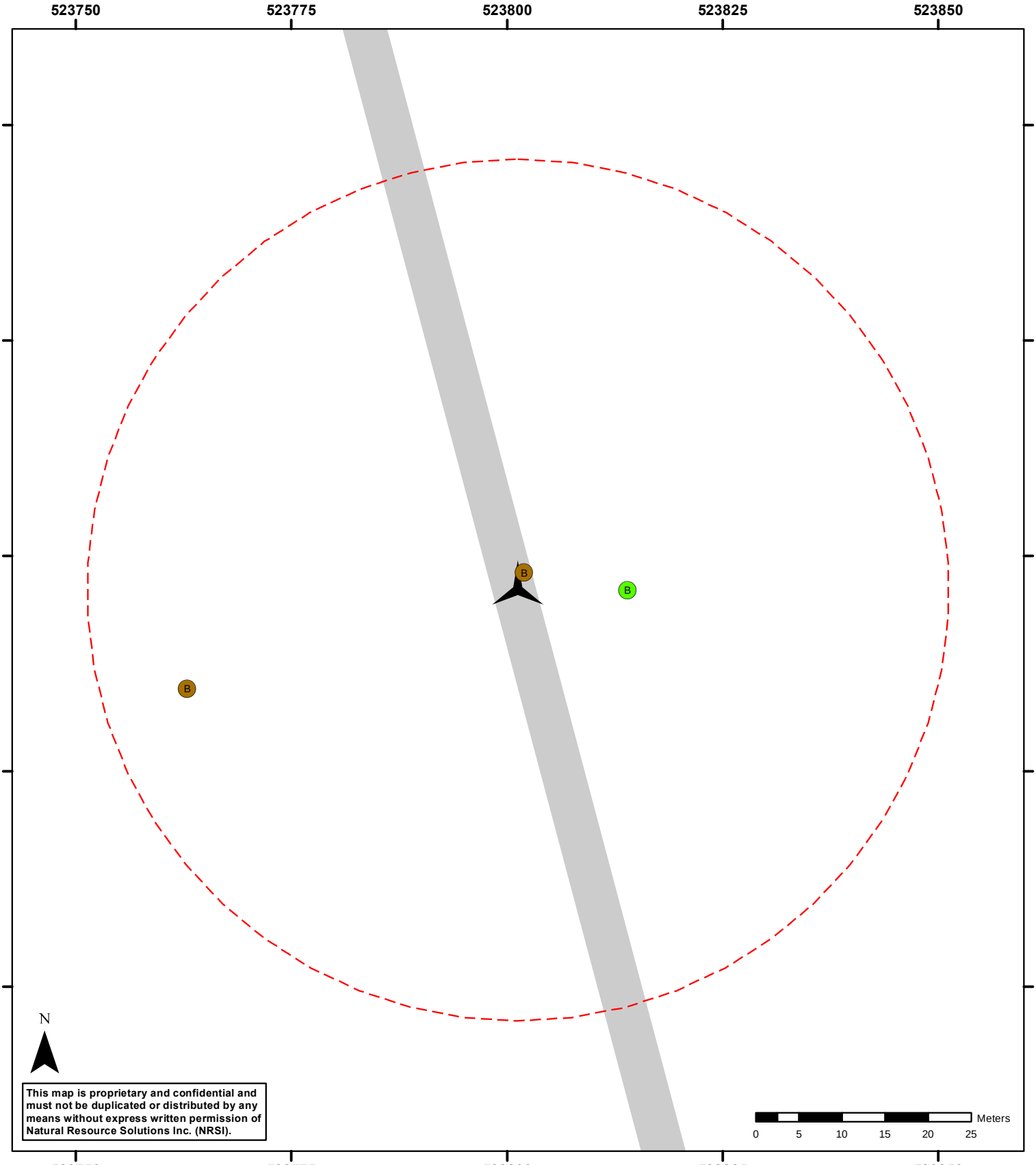

Legend

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

Appendix VI

Gunn's Hill WF

Turbine 02 Mortalities 2018

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2019 Project: 1875B

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

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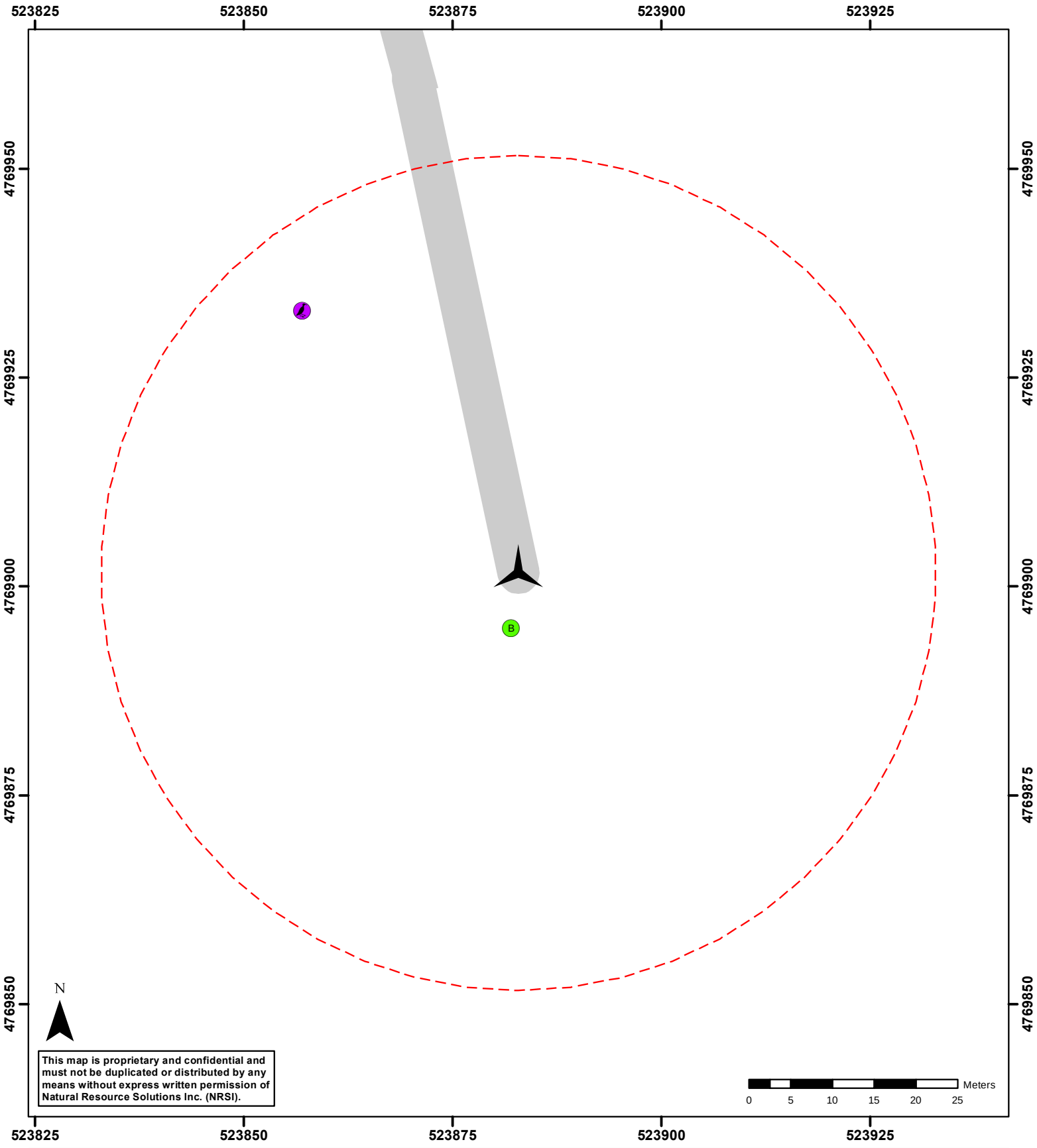

Legend

- Turbine
- Search Radius (50m)
- Access Road
- Hoary Bat
- Horned Lark

Appendix VI

Gunn's Hill WF

Turbine 03 Mortalities 2018

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2019 Project: 1875B

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

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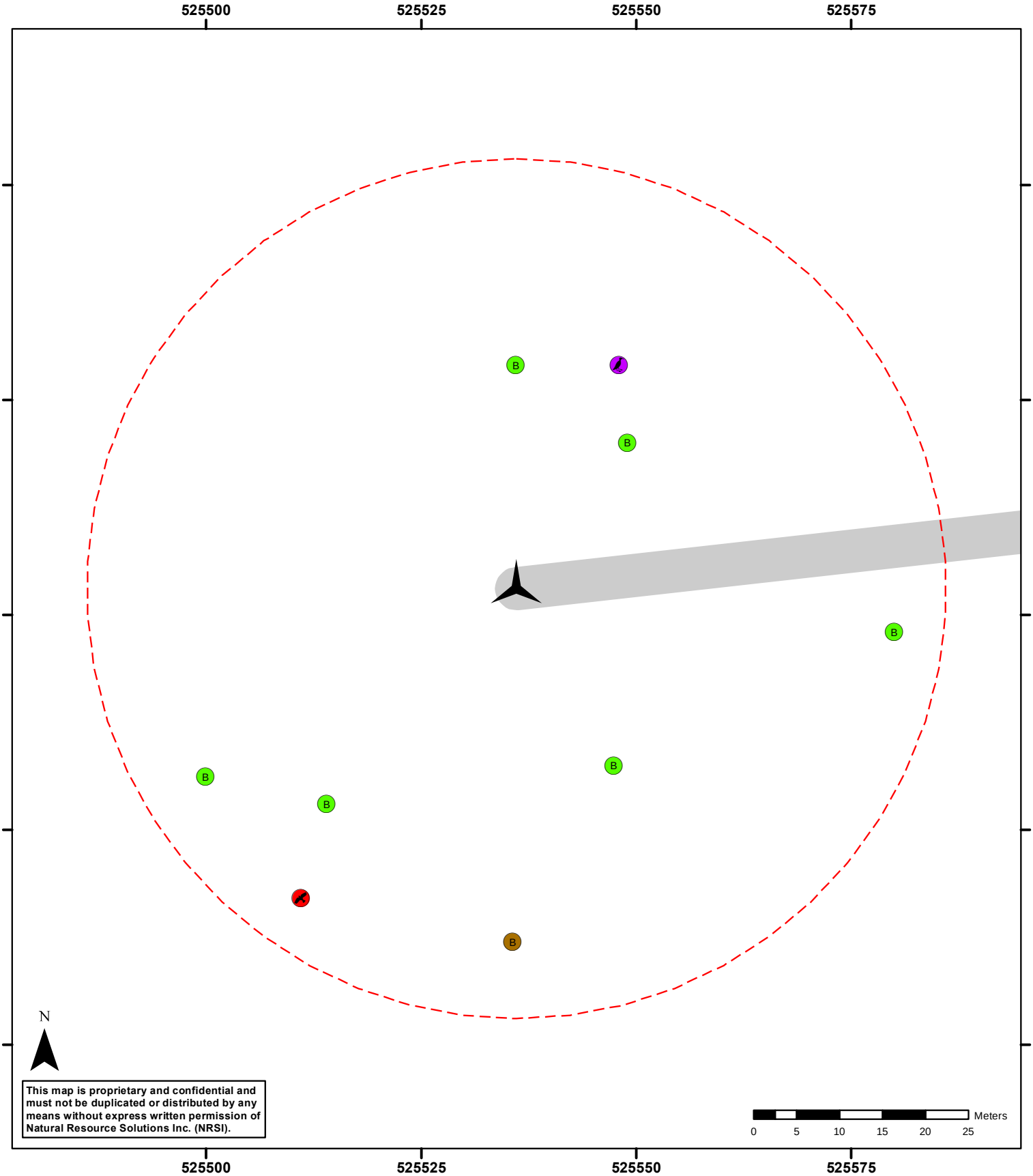

Legend

- Turbine
- Search Radius (50m)
- Access Road
- Big Brown Bat
- Hoary Bat
- Horned Lark
- Turkey Vulture

Appendix VI

Gunn's Hill WF

Turbine 04 Mortalities 2018

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

Date: January 9, 2019
Project: 1875B

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

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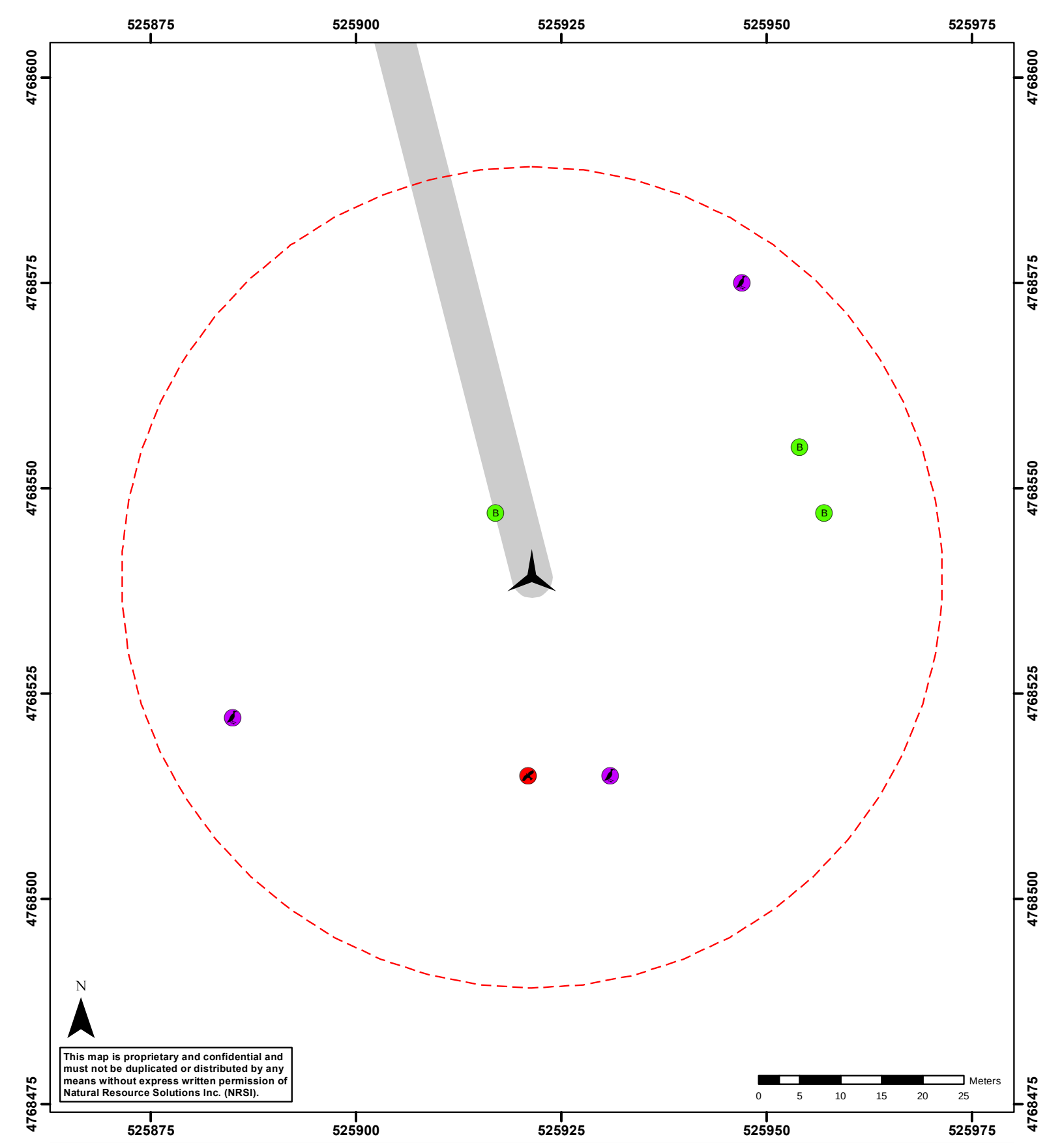

Legend

- Turbine
- Search Radius (50m)
- Access Road
- Hoary Bat
- Horned Lark
- Turkey Vulture

Appendix VI

Gunn's Hill WF

Turbine 05 Mortalities 2018

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2019 Project: 1875B

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

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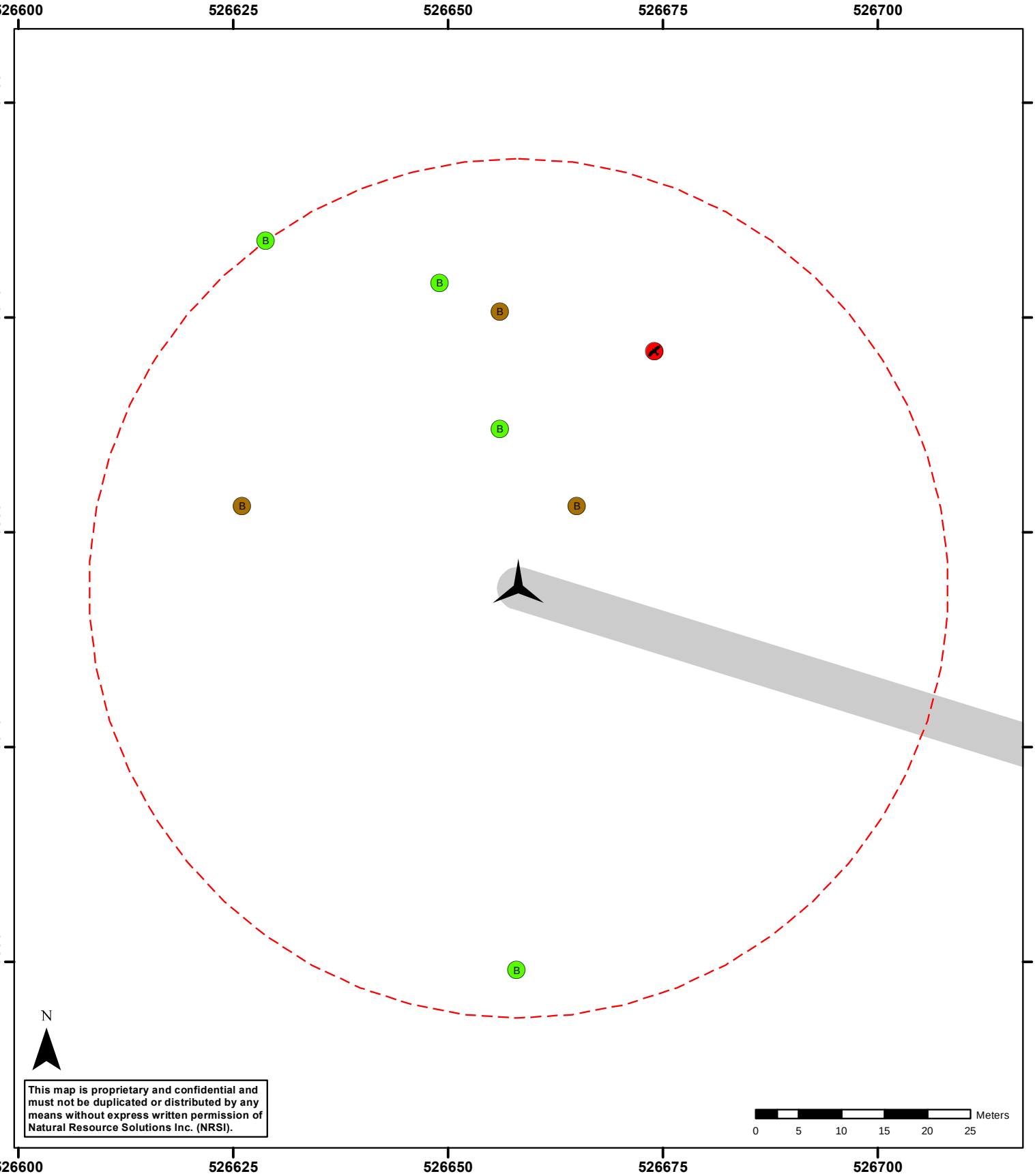

Legend

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

Appendix VI

Gunn's Hill WF

Turbine 06 Mortalities 2018

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

Date: January 9, 2019
Project: 1875B

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

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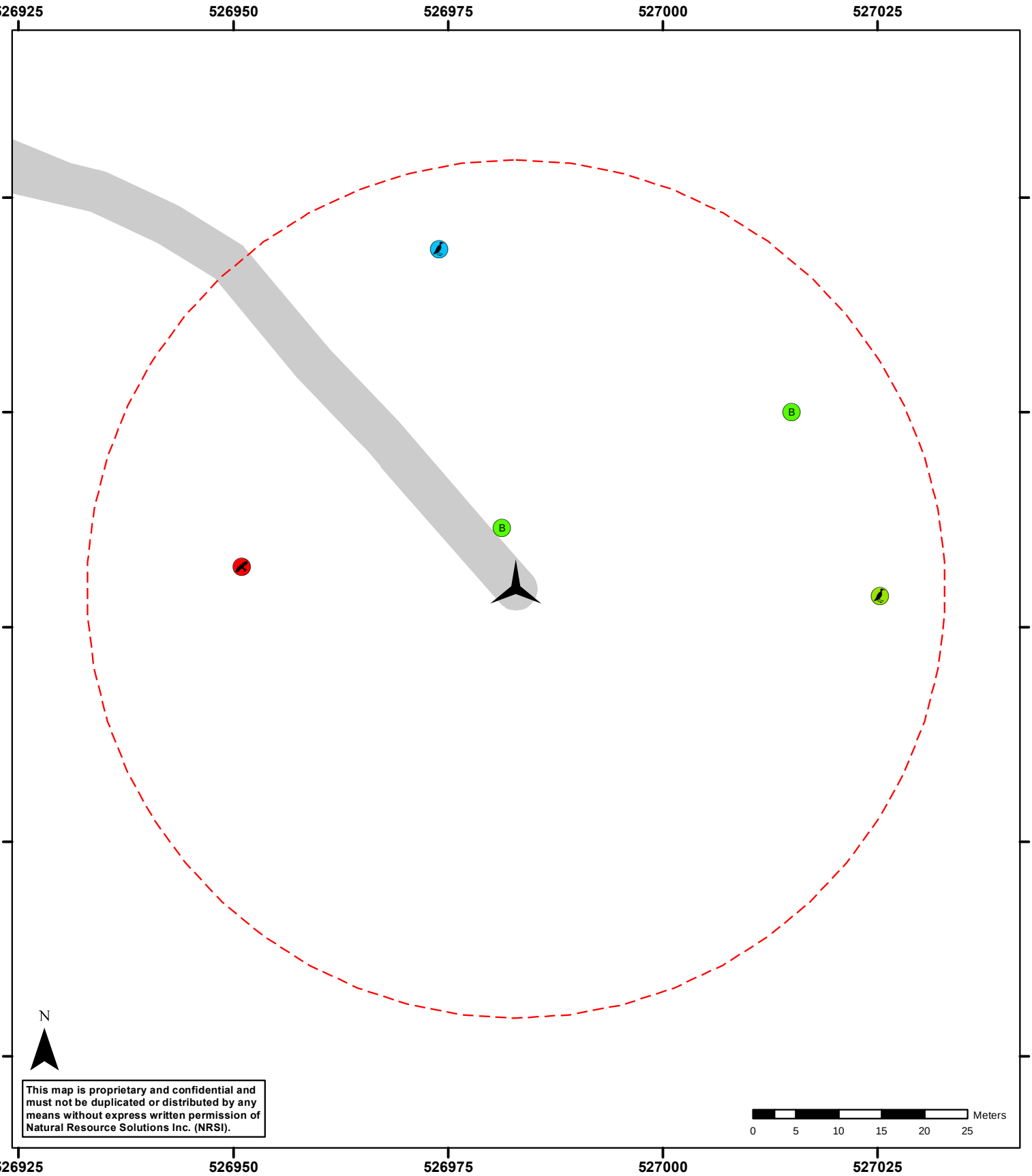

Legend

- Turbine
- Search Radius (50m)
- Access Road
- Hoary Bat
- Cliff Swallow
- Passerine sp.
- Turkey Vulture

Appendix VI

Gunn's Hill WF

Turbine 07 Mortalities 2018

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

Date: January 9, 2019
Project: 1875B

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

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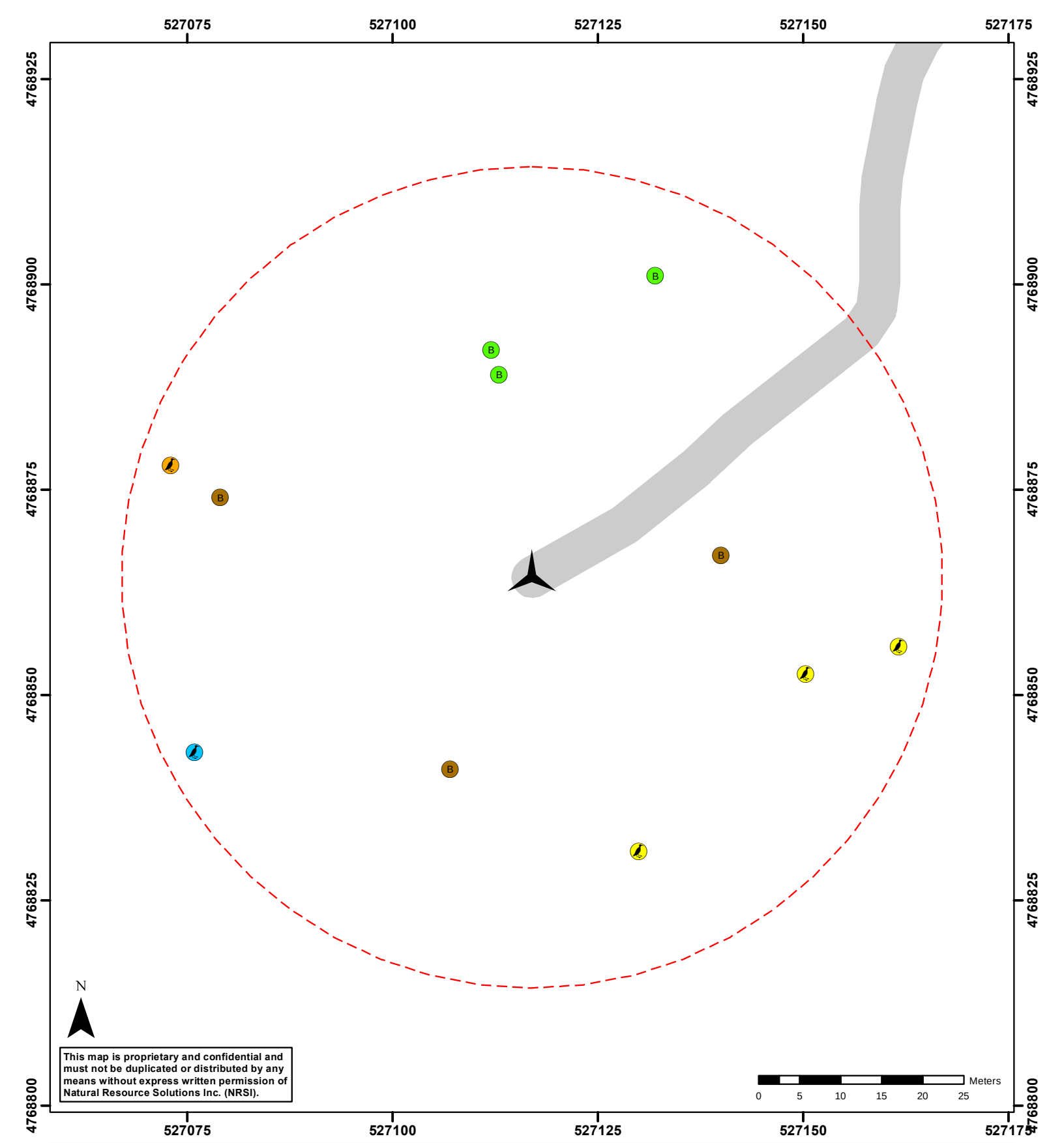

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Legend

- Turbine
- Search Radius (50m)
- Access Road
- Big Brown Bat
- Hoary Bat
- Bird sp.
- Cliff Swallow
- Golden-crowned Kinglet

Appendix VI

Gunn's Hill WF

Turbine 08 Mortalities 2018

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

Date: January 9, 2019
Project: 1875B

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

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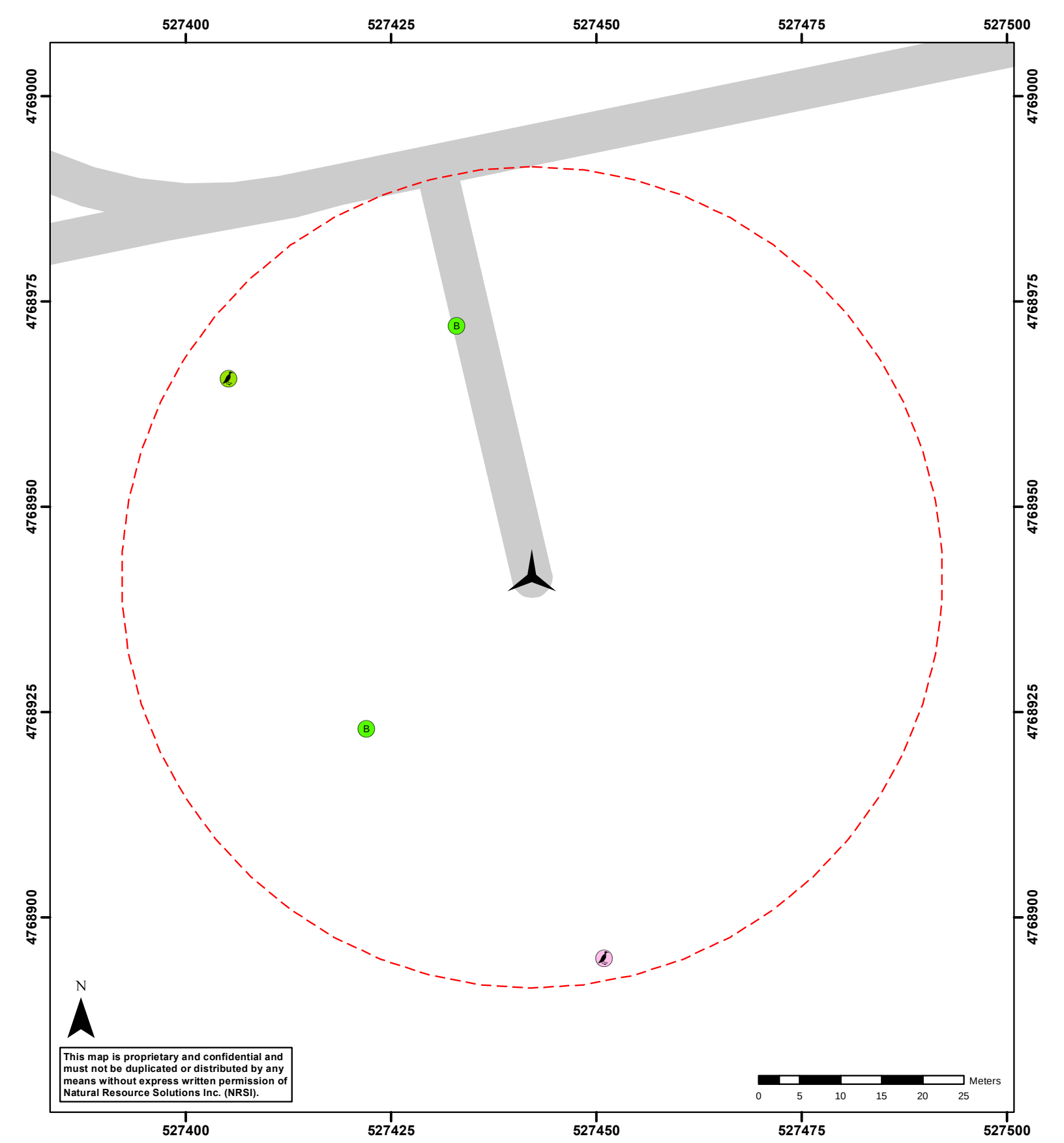

Legend

- Turbine
- Search Radius (50m)
- Access Road
- Hoary Bat
- Magnolia Warbler
- Passerine sp.

Appendix VI

Gunn's Hill WF

Turbine 09 Mortalities 2018

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2019 Project: 1875B

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

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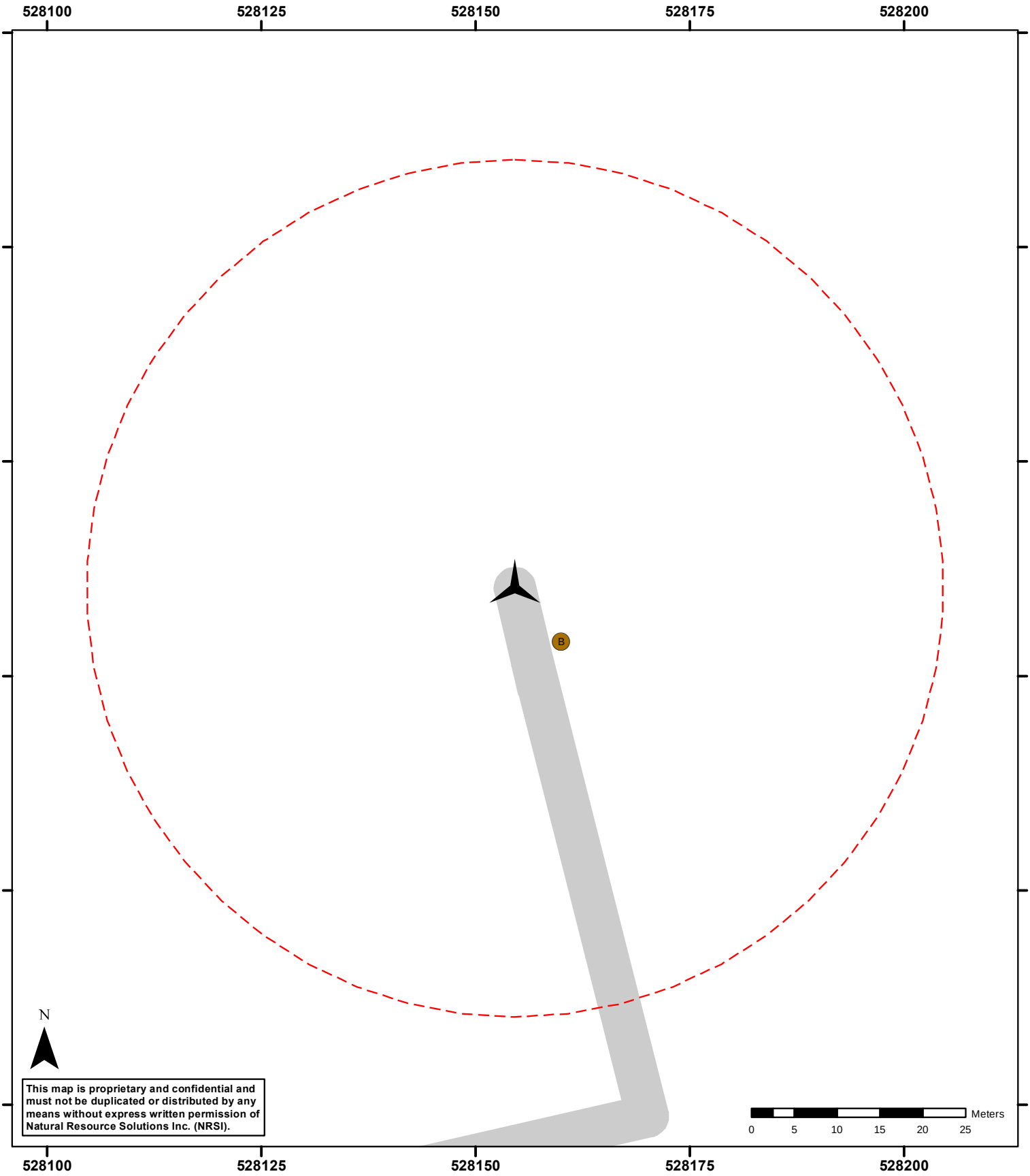


Legend

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

Appendix VI

Gunn's Hill WF

Turbine 10 Mortalities 2018

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 9, 2019 Project: 1875B

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

Path: X:\1875_GunnsHillWindFarm\NRSI_1875B_AppendixVI_TurbineMortalities_1K_2019_01_09_KEF.mxd

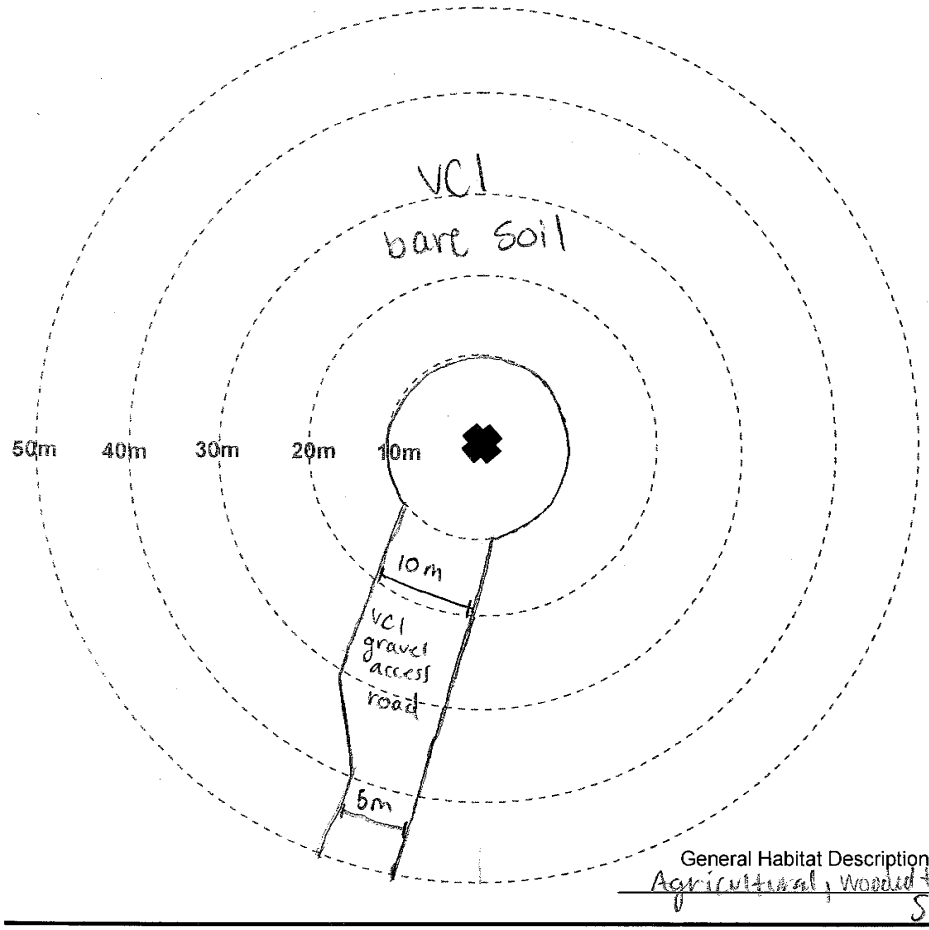
Appendix VII
Visibility Class Mapping

Visibility Class Map

Project Name: Gunn's Hill WF **Project #:** 18758 **Turbine #:** 01 **Degree of Slope** 0 **degrees** **Slope Orientation** N/A (e.g. SSW)

Photo Numbers (from turbine base)
Facing North: 3643
Facing East: 3644
Facing South: 3645
Facing West: 3646
(sketch habitat and visibility classes)

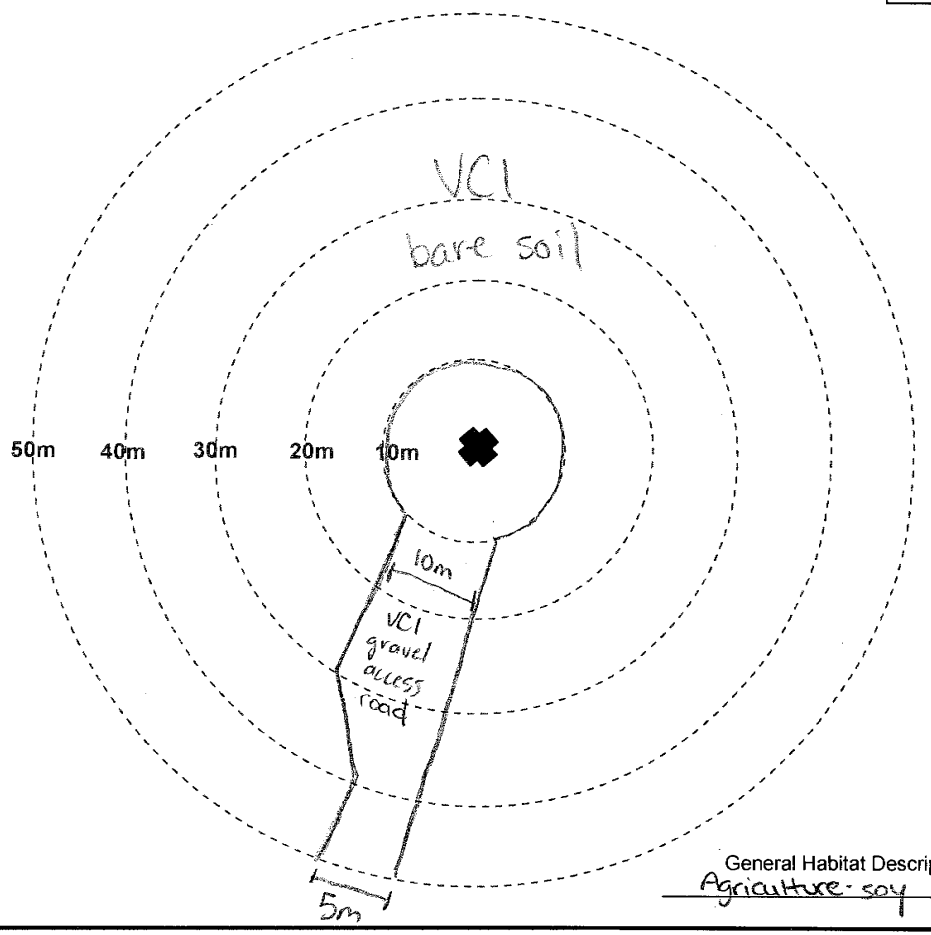
Date (DD/MM/YY): 29/05/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agricultural, wooded to S

Photo Numbers (from turbine base)
Facing North: 3806
Facing East: 3807
Facing South: 3808
Facing West: 3809
(sketch habitat and visibility classes)

Date (DD/MM/YY): 12/06/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture- soy

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: Gunns Hill WF **Project #:** 19758 **Turbine #:** 01

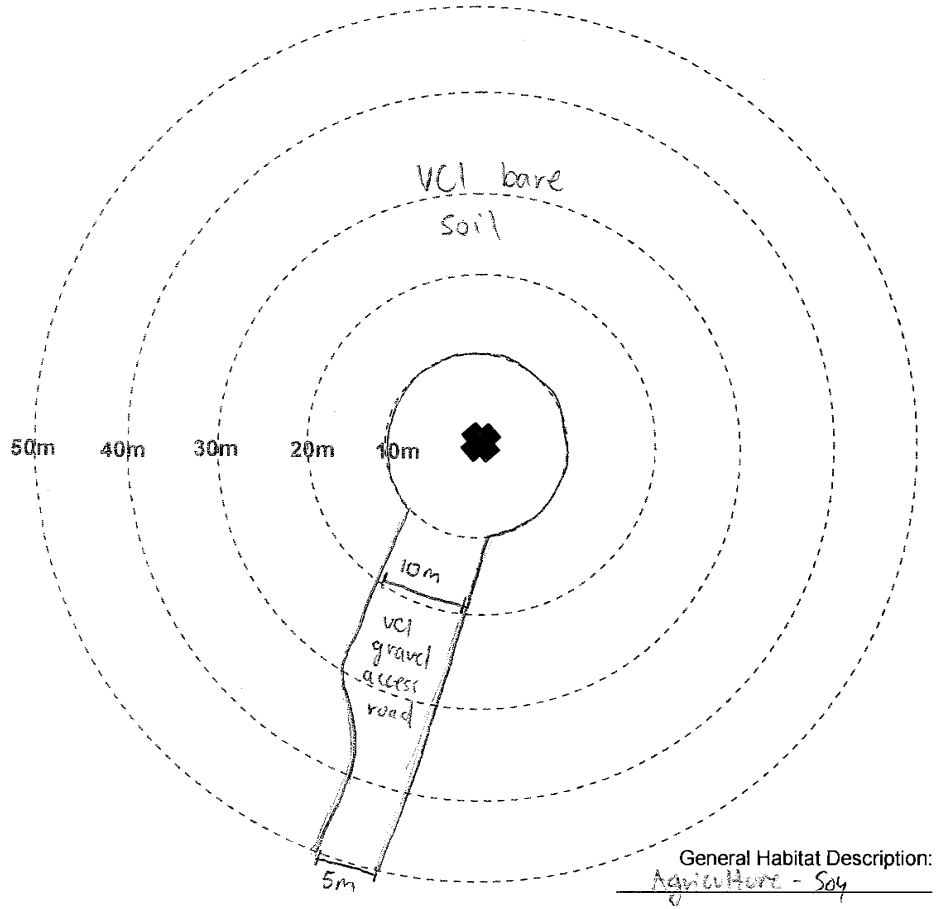
Photo Numbers (from turbine base)
Facing North: 3940
Facing East: 3941
Facing South: 3942
Facing West: 3943
(sketch habitat and visibility classes)

Date (DD/MM/YY): 24/07/18

Observer: GAVIN F.

Monthly/Seasonal
Linear Transect Width: 5 m

N



General Habitat Description:
Agriculture - Soy

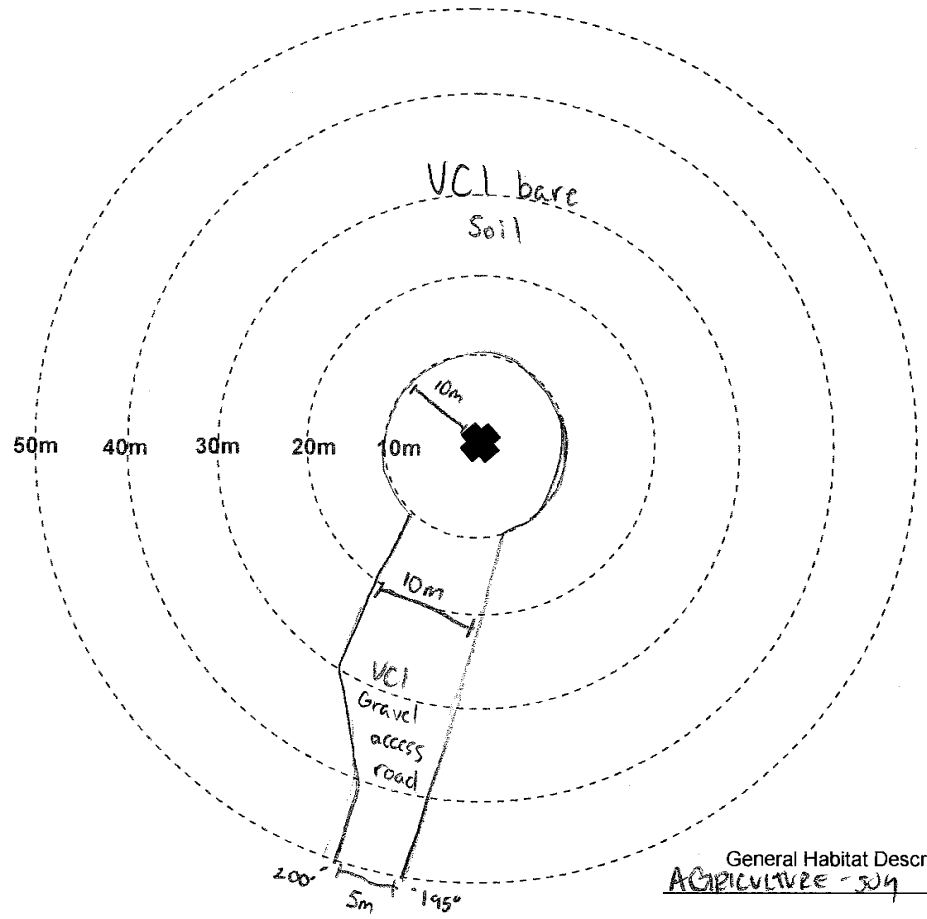
Photo Numbers (from turbine base)
Facing North: 4225 ✓
Facing East: 4226 ✓
Facing South: 4227 ✓
Facing West: 4228 ✓
(sketch habitat and visibility classes)

Date (DD/MM/YY): 17/08/18

Observer: GAVIN F

Monthly/Seasonal
Linear Transect Width: 5 m

N



General Habitat Description:
AGRICULTURE - SOY

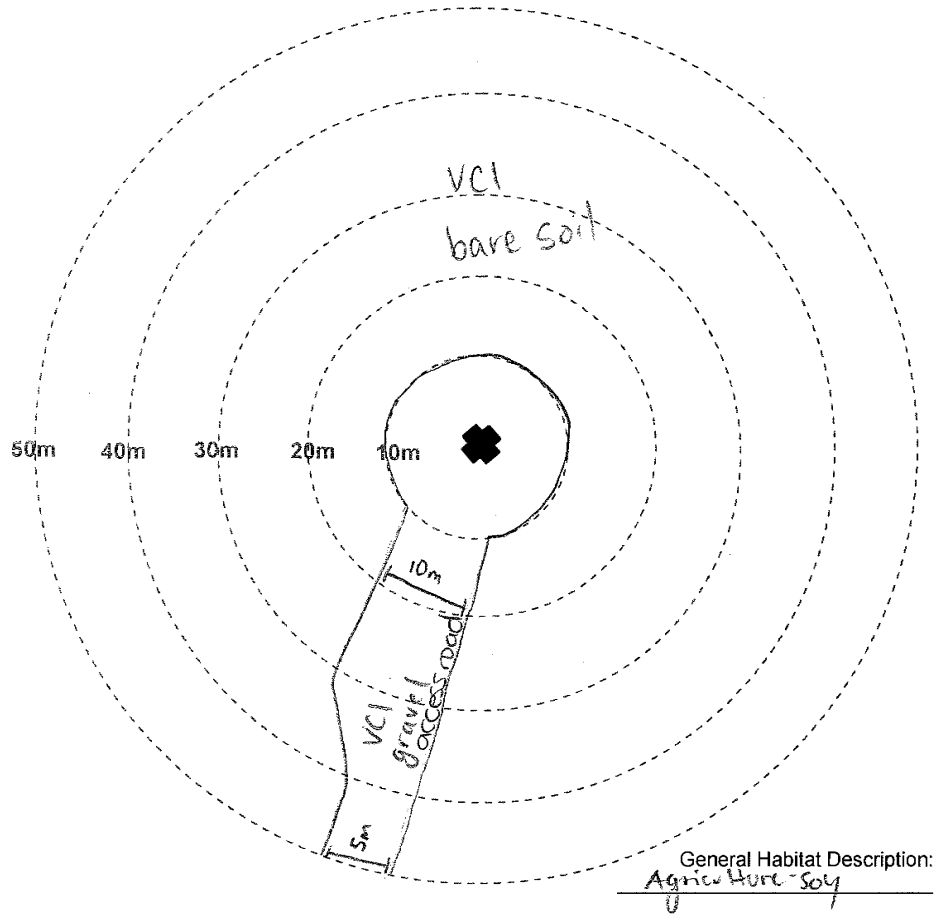
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunns Hill WF **Project #:** 18758 **Turbine #:** 01

Photo Numbers (from turbine base)
Facing North: 4507
Facing East: 4508
Facing South: 4509
Facing West: 4510
(sketch habitat and visibility classes)

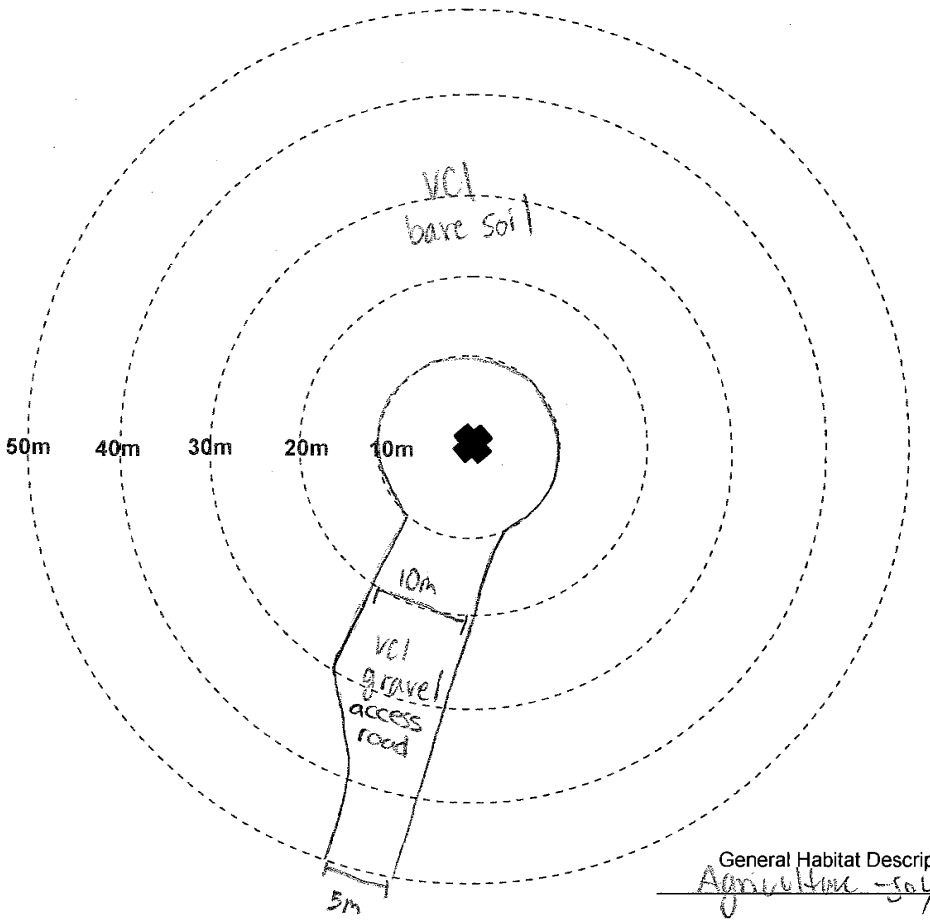
Date (DD/MM/YY): 25/09/18
Observer: Gavin F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - Soy

Photo Numbers (from turbine base)
Facing North: 4650
Facing East: 4651
Facing South: 4652
Facing West: 4653
(sketch habitat and visibility classes)

Date (DD/MM/YY): 23/10/18
Observer: Gavin F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - Soy

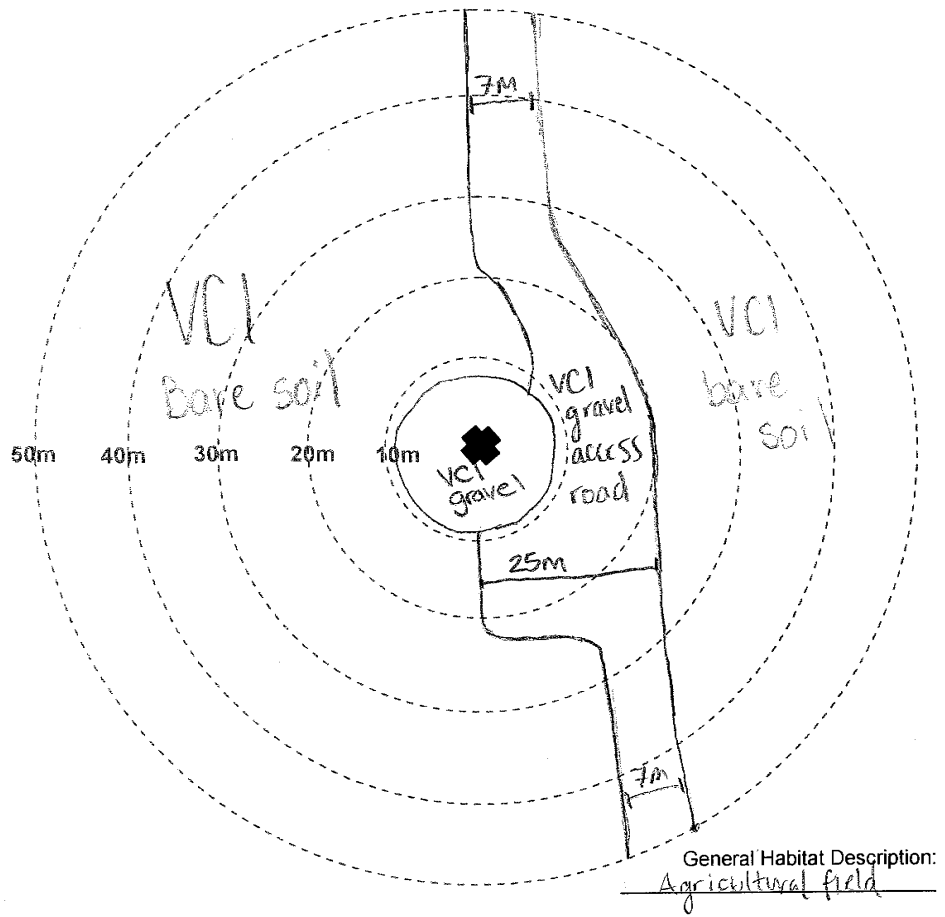
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunn's Hill WF **Project #:** 18758 **Turbine #:** 02 **Degree of Slope** 0 **degrees** **Slope Orientation** N/A (e.g. SSW)

Photo Numbers (from turbine base)
Facing North: 3647
Facing East: 3648
Facing South: 3649
Facing West: 3650
(sketch habitat and visibility classes)

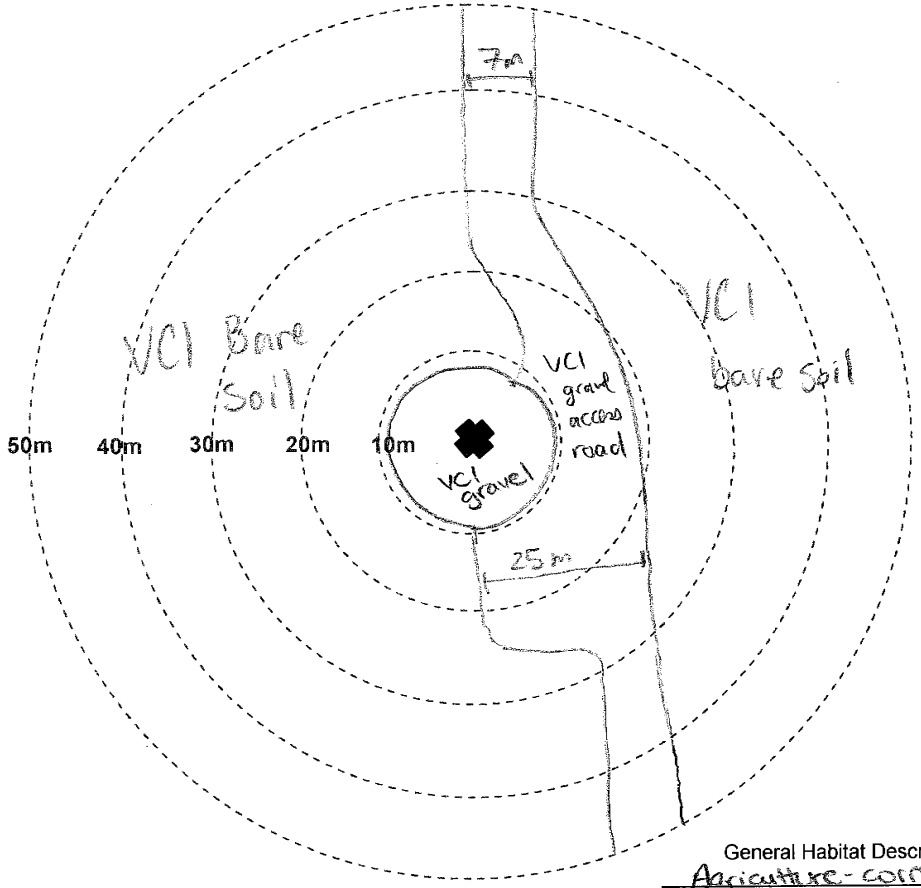
Date (DD/MM/YY): 29/05/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agricultural field

Photo Numbers (from turbine base)
Facing North: 3816
Facing East: 3811
Facing South: 3812
Facing West: 3813
(sketch habitat and visibility classes)

Date (DD/MM/YY): 12/06/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - corn

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

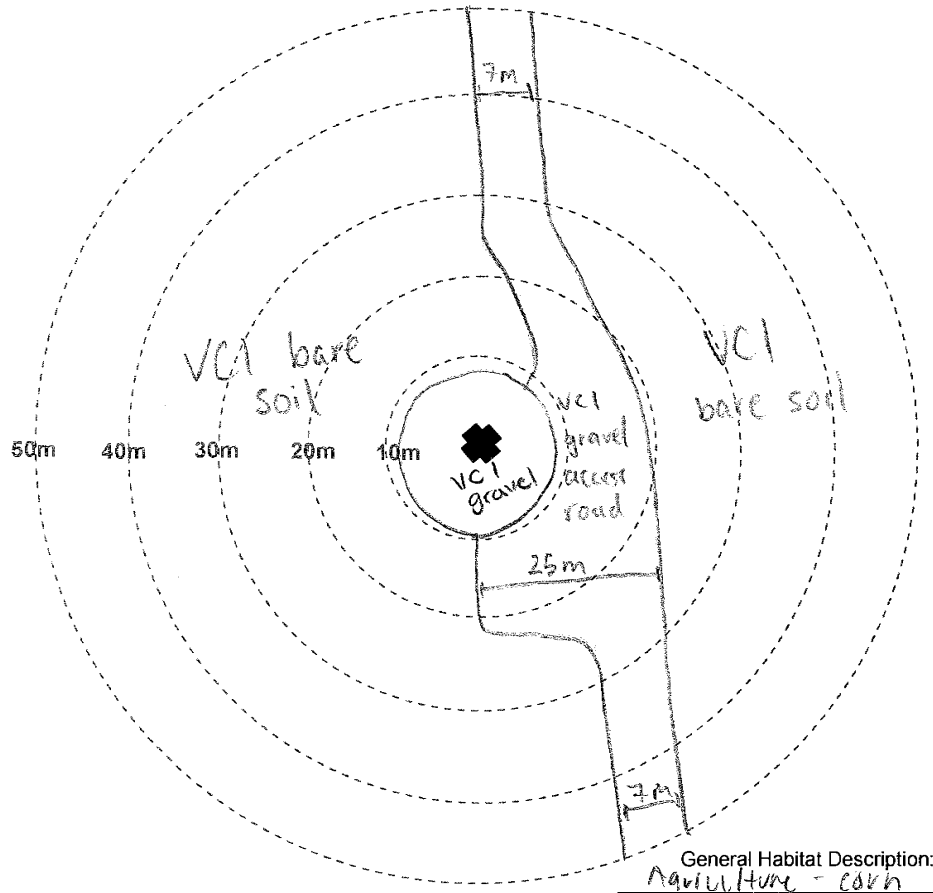
Project Name: Gunns Hill WF **Project #:** 18758 **Turbine #:** 02

Photo Numbers (from turbine base)
Facing North: 3944
Facing East: 3945
Facing South: 3946
Facing West: 3947
(sketch habitat and visibility classes)

Date (DD/MM/YY): 24/07/18

Observer: Gavin F.

Monthly/Seasonal Linear Transect Width: 5 m



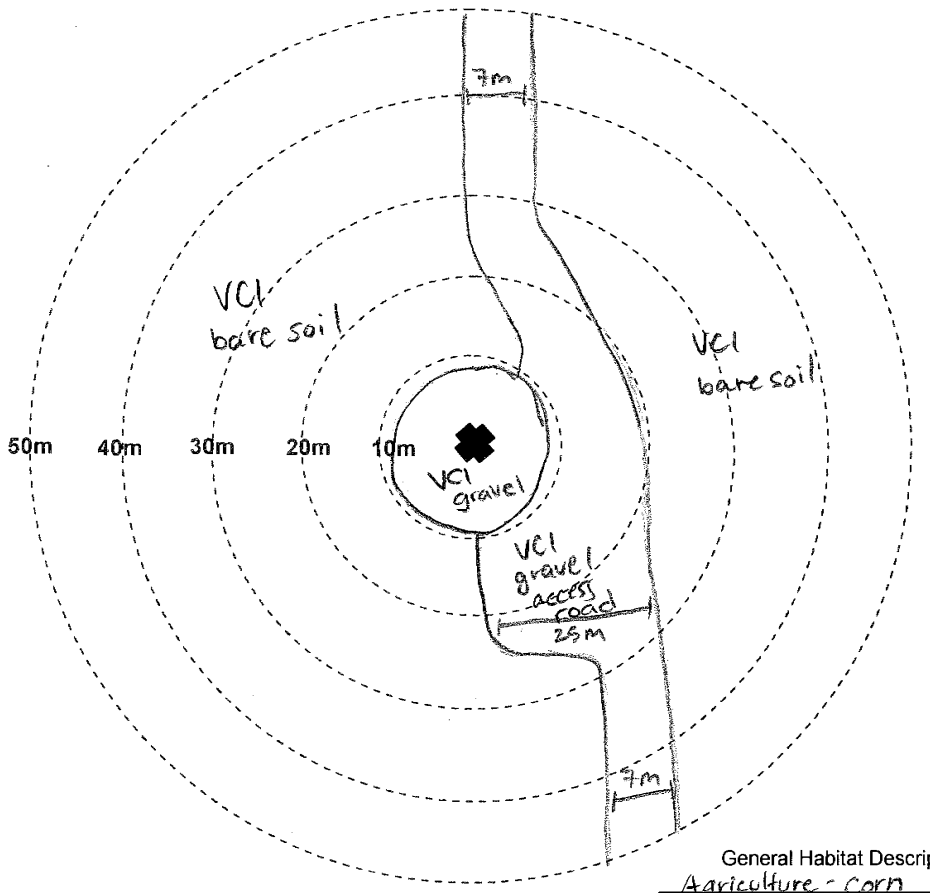
General Habitat Description: Agriculture - corn

Photo Numbers (from turbine base)
Facing North: 4229
Facing East: 4230
Facing South: 4231
Facing West: 4232
(sketch habitat and visibility classes)

Date (DD/MM/YY): 17/08/18

Observer: GAVIN F

Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - corn

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

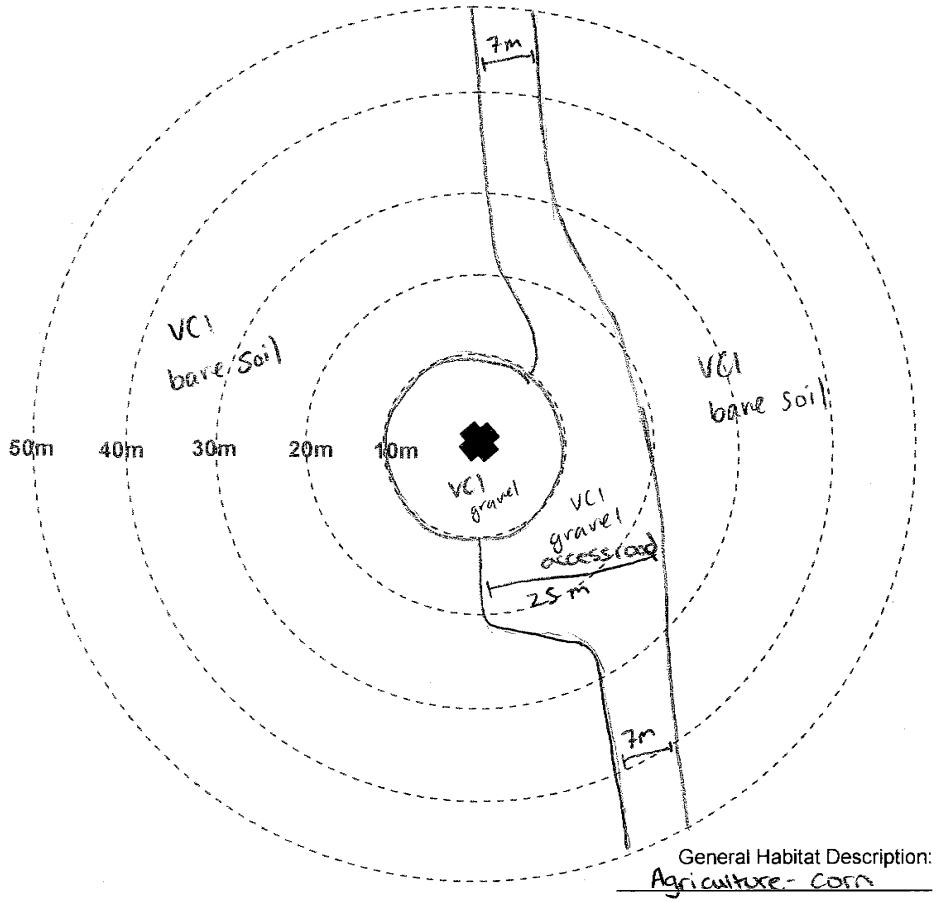
Project Name: Gunn's Hill WF **Project #:** 10758 **Turbine #:** 02

Photo Numbers (from turbine base)
Facing North: 4511
Facing East: 4512
Facing South: 4513
Facing West: 4514
(sketch habitat and visibility classes)

Date (DD/MM/YY): 25/09/18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m



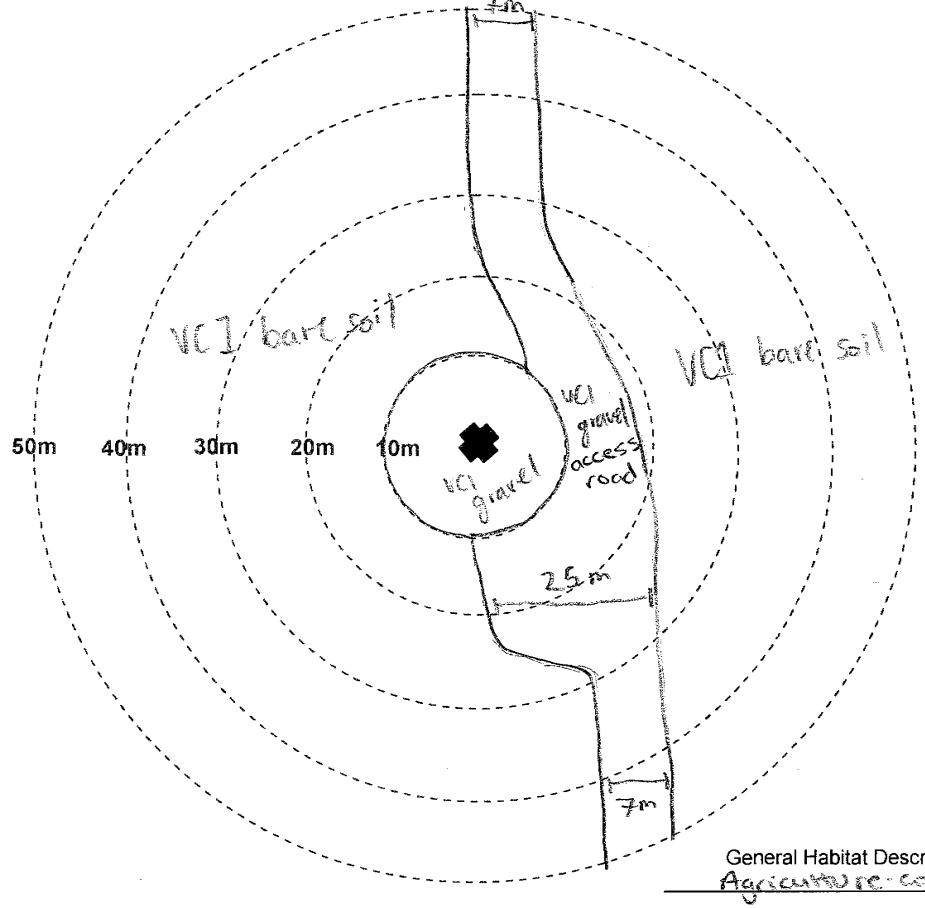
General Habitat Description: Agriculture - corn

Photo Numbers (from turbine base)
Facing North: 4654
Facing East: 4655
Facing South: 4656
Facing West: 4657
(sketch habitat and visibility classes)

Date (DD/MM/YY): 23/10/18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - corn

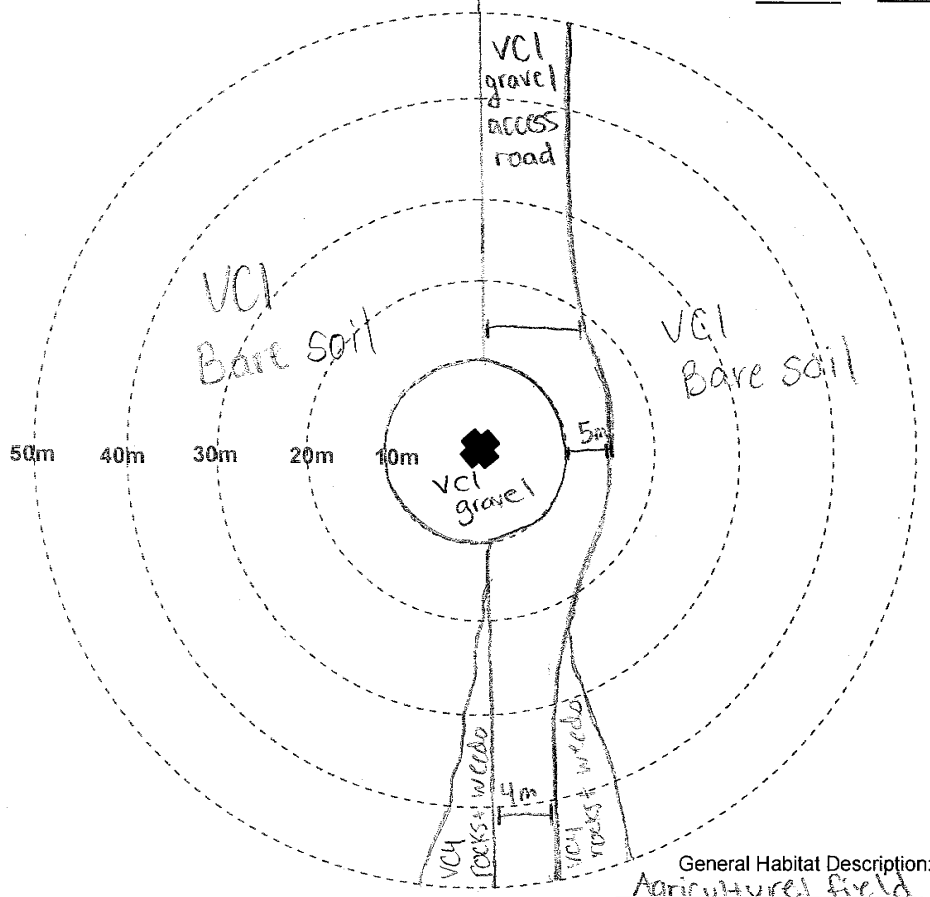
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunn's Hill WF **Project #:** 1875B **Turbine #:** 03 **Degree of Slope** 0 **degrees** **Slope Orientation** N/A (e.g. SSW)

Photo Numbers (from turbine base)
Facing North: 3651
Facing East: 3652
Facing South: 3653
Facing West: 3654
(sketch habitat and visibility classes)

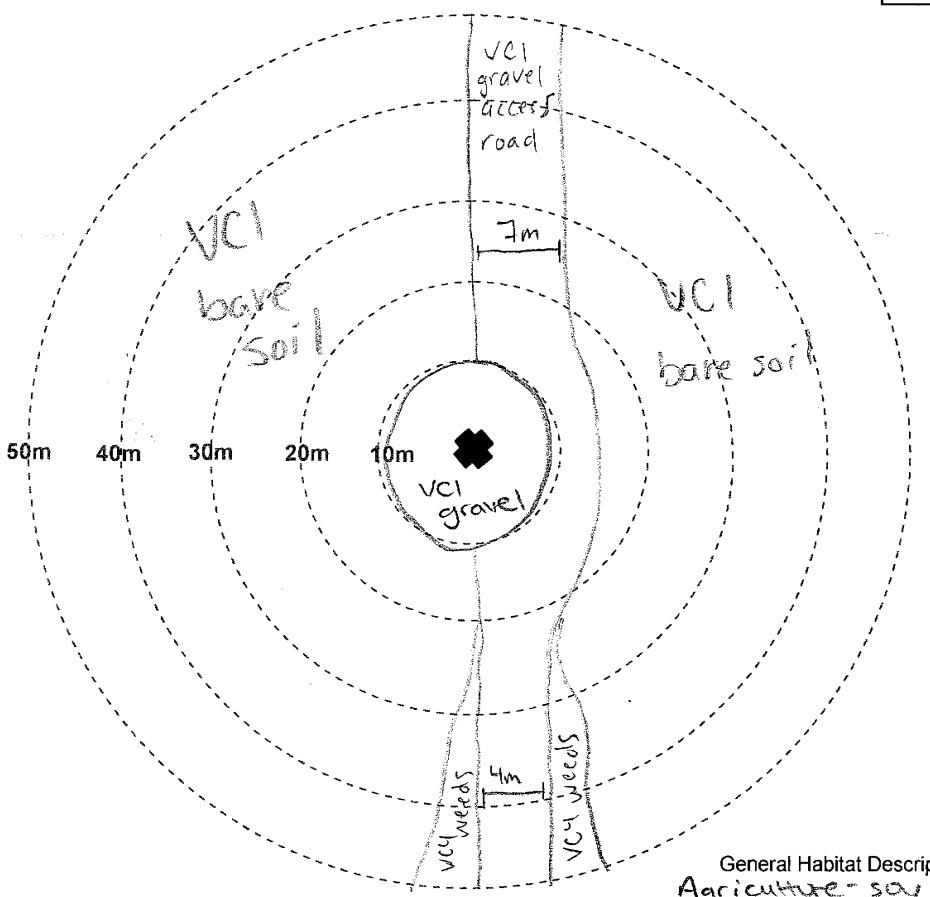
Date (DD/MM/YY): 29/05/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agricultural field

Photo Numbers (from turbine base)
Facing North: 3814
Facing East: 3815
Facing South: 3816
Facing West: 3817
(sketch habitat and visibility classes)

Date (DD/MM/YY): 12/06/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - soy

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 WF **Project #:** 1875B **Turbine #:** 03

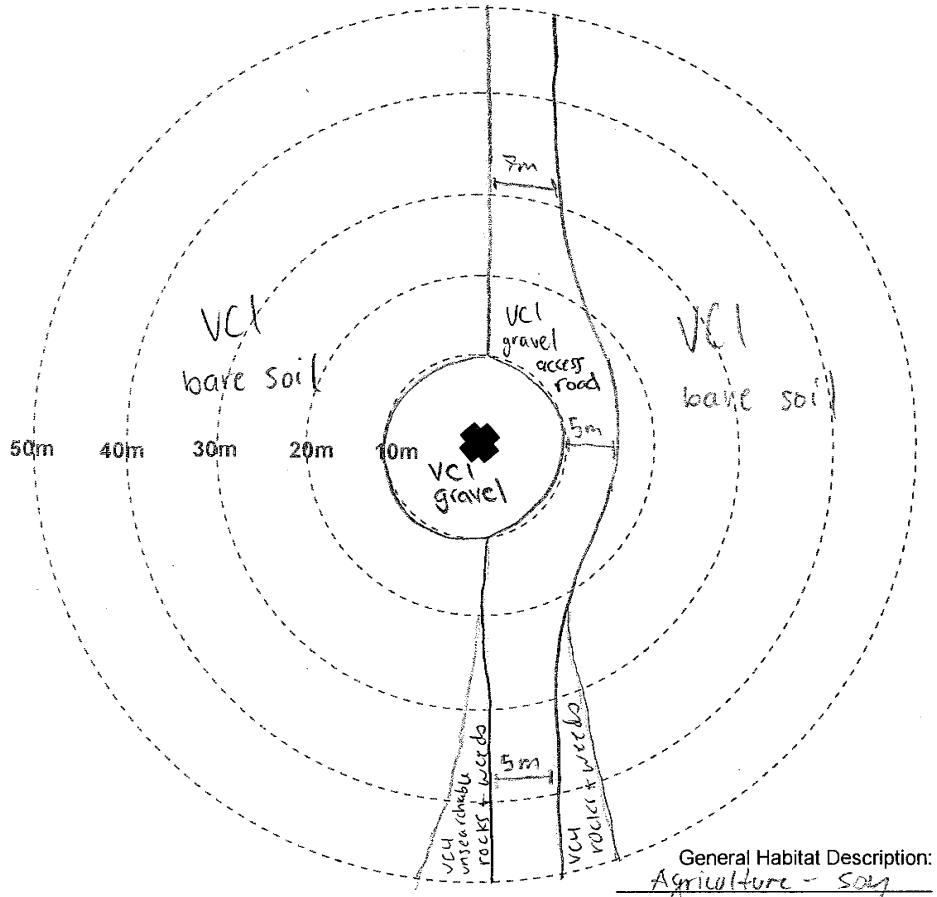
Photo Numbers (from turbine base)
Facing North: 3949
Facing East: 3950
Facing South: 3951
Facing West: 3952
(sketch habitat and visibility classes)

Date (DD/MM/YY): 24/07/18

Observer: GAVIN F

Monthly/Seasonal Linear Transect Width: 5 m

N



General Habitat Description: Agriculture - soy

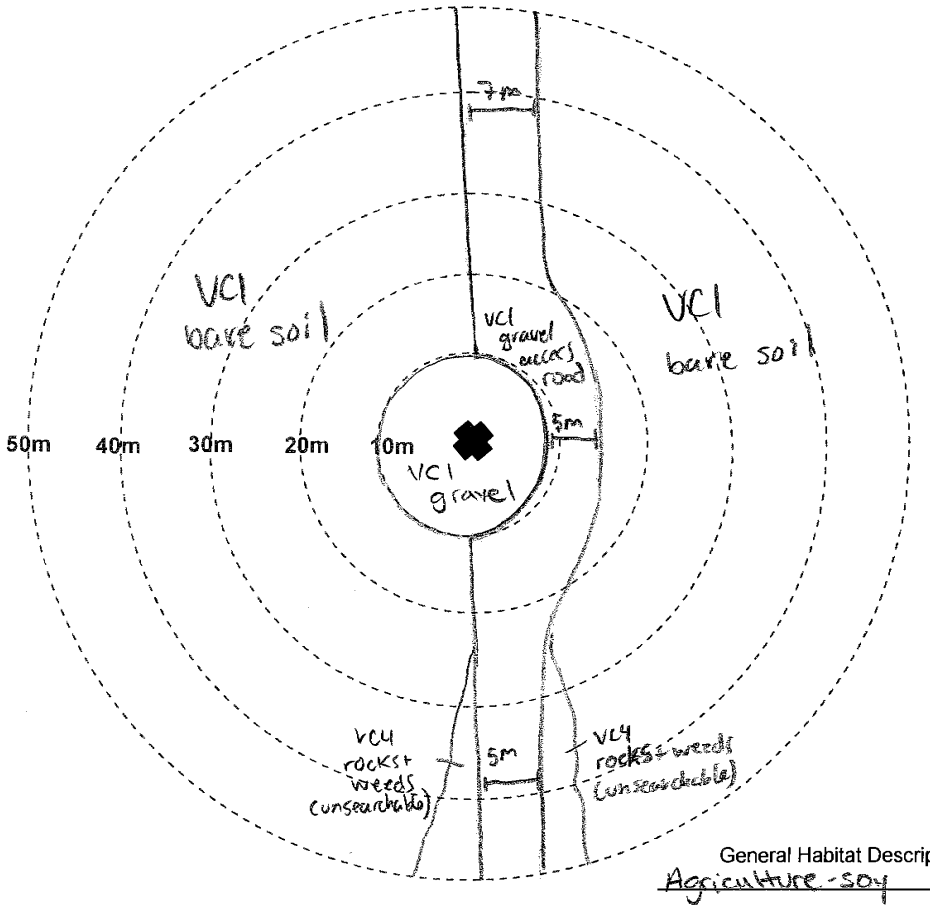
Photo Numbers (from turbine base)
Facing North: 4233
Facing East: 4234
Facing South: 4235
Facing West: 4236
(sketch habitat and visibility classes)

Date (DD/MM/YY): 17/08/18

Observer: GAVIN F

Monthly/Seasonal Linear Transect Width: 5 m

N



General Habitat Description: Agriculture - soy

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 WF **Project #:** 1875B **Turbine #:** 03

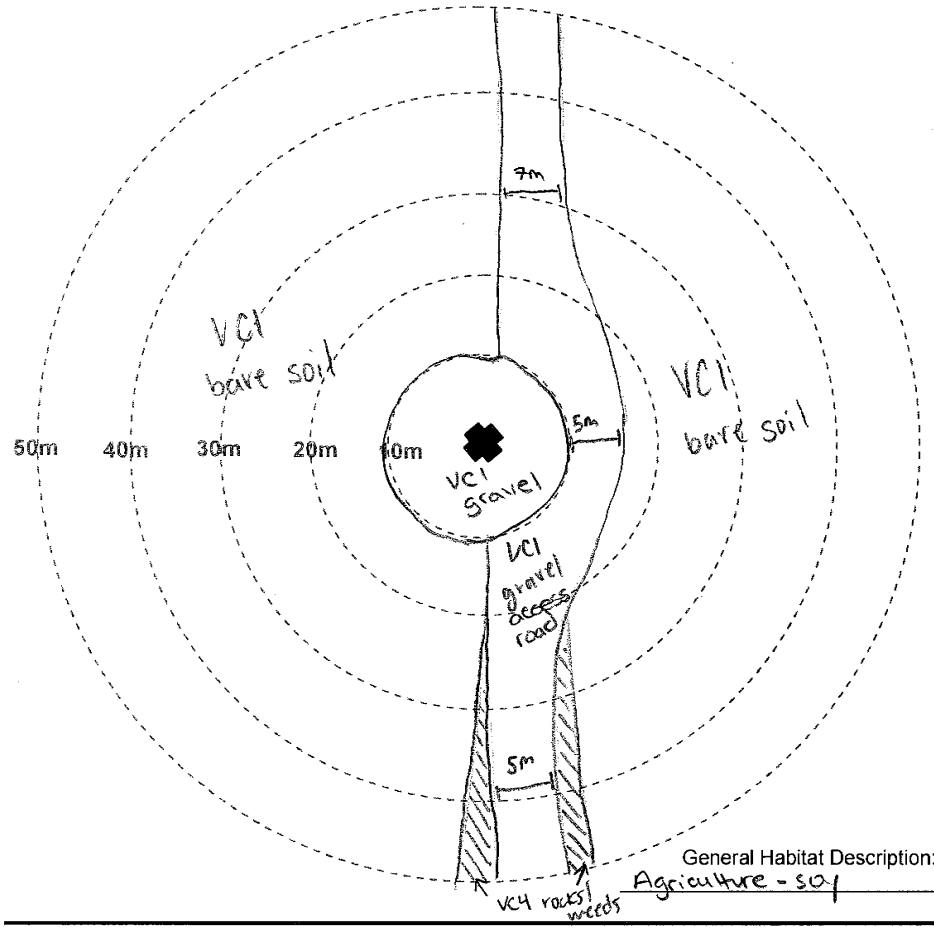
Photo Numbers (from turbine base)
Facing North: 4515
Facing East: 4516
Facing South: 4517
Facing West: 4518
(sketch habitat and visibility classes)

Date (DD/MM/YY): 25/09/18

Observer: Gavin F

Monthly/Seasonal
Linear Transect Width: 5 m

N



General Habitat Description: Agriculture - soy

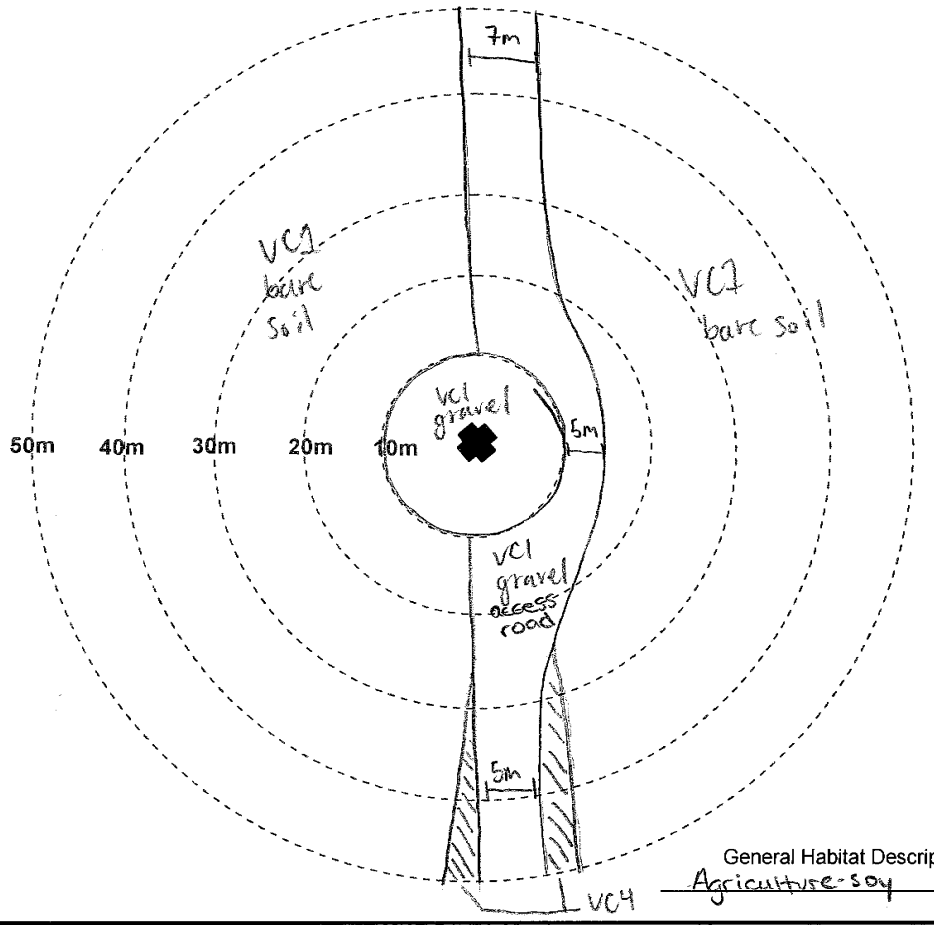
Photo Numbers (from turbine base)
Facing North: 4658
Facing East: 4659
Facing South: 4660
Facing West: 4661
(sketch habitat and visibility classes)

Date (DD/MM/YY): 23/10/18

Observer: Gavin F.

Monthly/Seasonal
Linear Transect Width: 5 m

N



General Habitat Description: Agriculture - soy

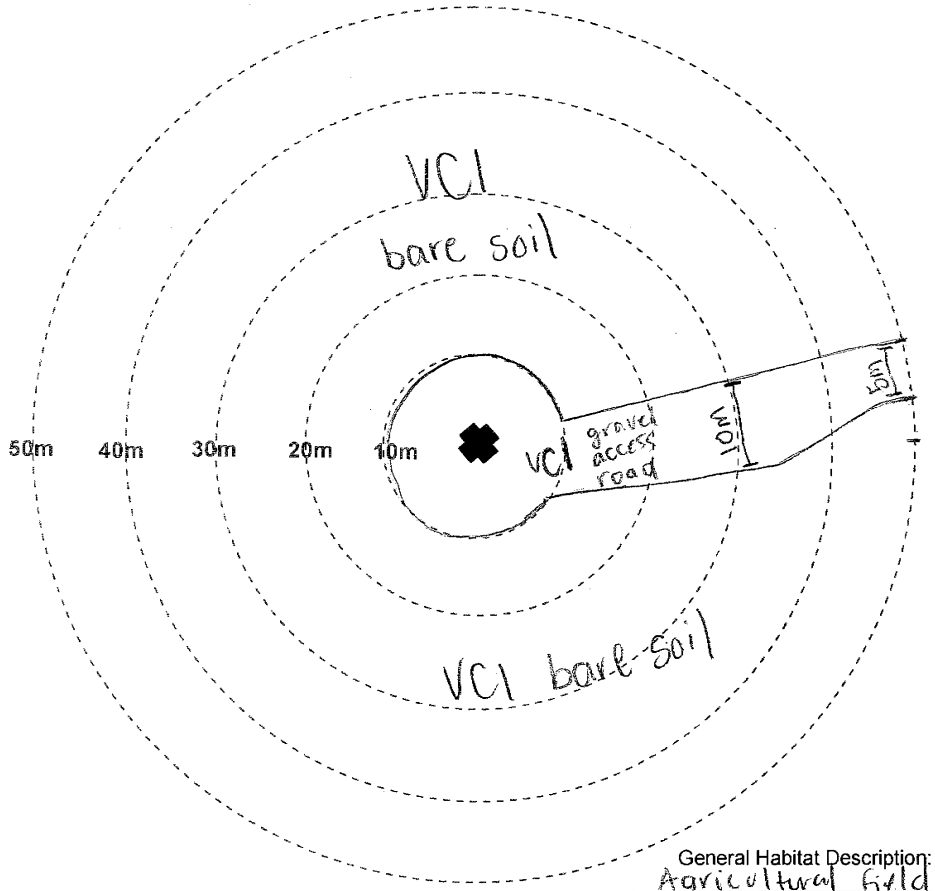
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunn's Hill WF **Project #:** 1875B **Turbine #:** 04 **Degree of Slope** 2 **degrees** **Slope Orientation** SE *(e.g. SSW)*

Photo Numbers (from turbine base)
Facing North: 3663
Facing East: 3664
Facing South: 3665
Facing West: 3666
(sketch habitat and visibility classes)

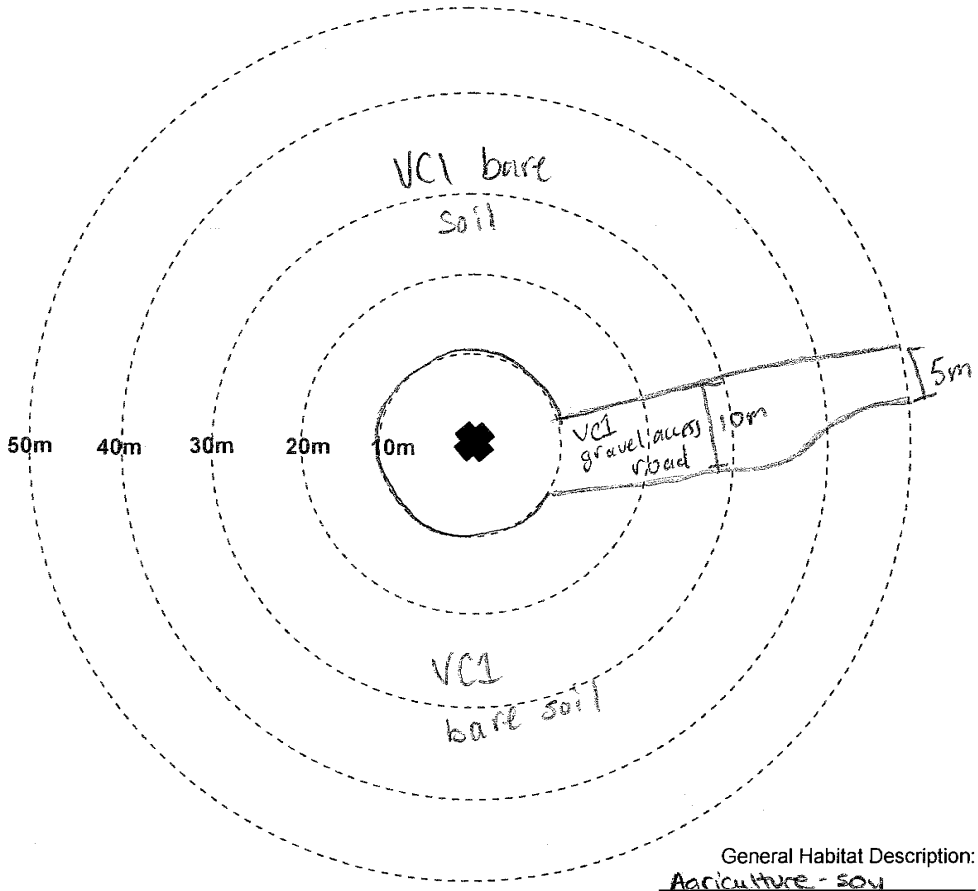
Date (DD/MM/YY): 29/05/18
Observer: GAVIN F.
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agricultural field

Photo Numbers (from turbine base)
Facing North: 3830
Facing East: 3831
Facing South: 3832
Facing West: 3833
(sketch habitat and visibility classes)

Date (DD/MM/YY): 12/06/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - soy

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

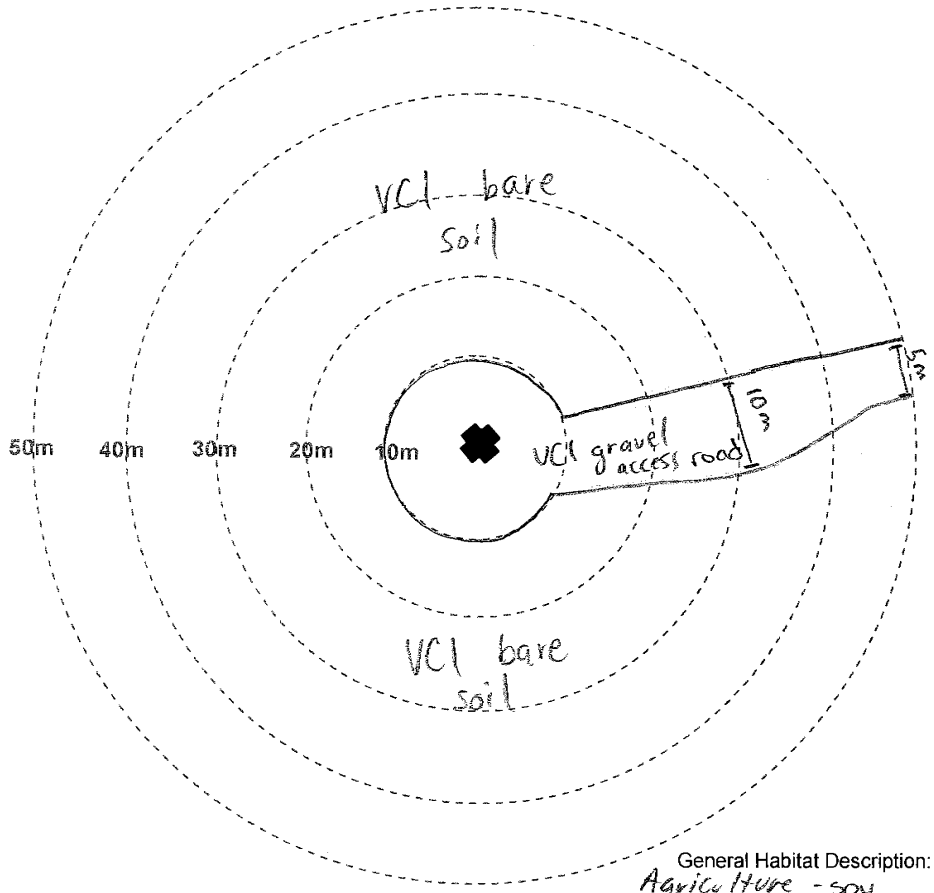
Project Name: Gunns Hill WF **Project #:** 18758 **Turbine #:** 04

Photo Numbers (from turbine base)
Facing North: 3966
Facing East: 3967
Facing South: 3968
Facing West: 3969
(sketch habitat and visibility classes)

Date (DD/MM/YY): 24/07/18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m



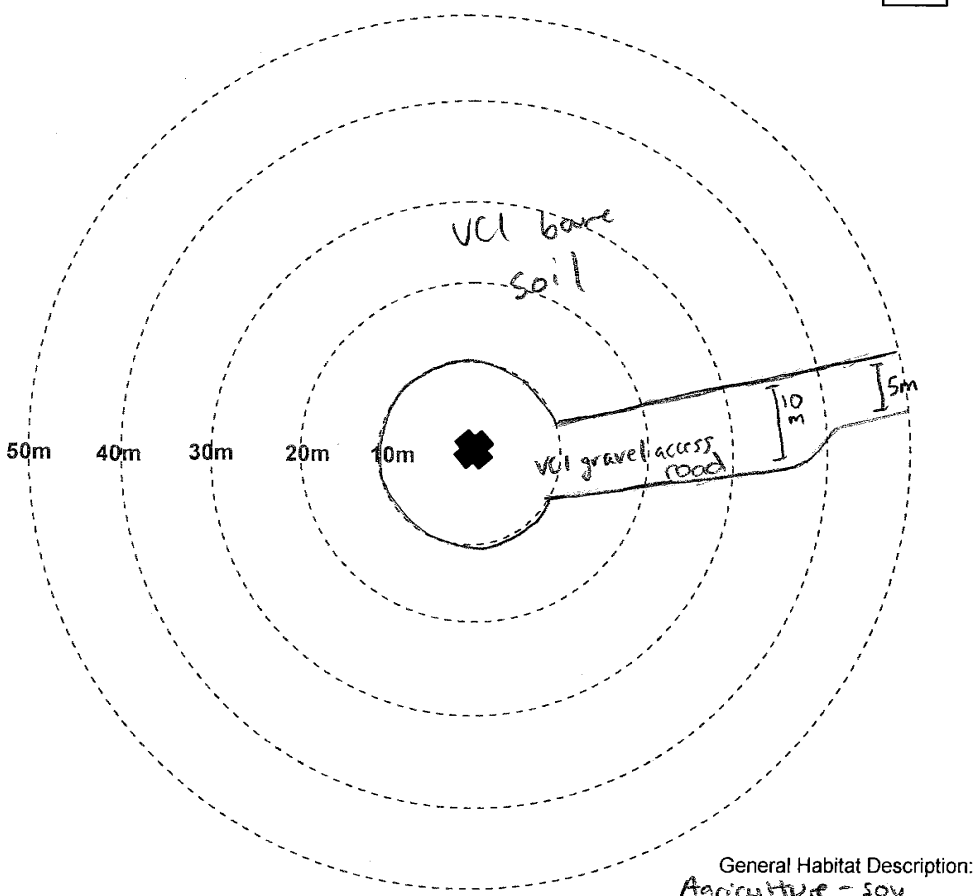
General Habitat Description: Agriculture - soy

Photo Numbers (from turbine base)
Facing North: 4252
Facing East: 4253
Facing South: 4254
Facing West: 4255
(sketch habitat and visibility classes)

Date (DD/MM/YY): 17/08/18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - soy

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

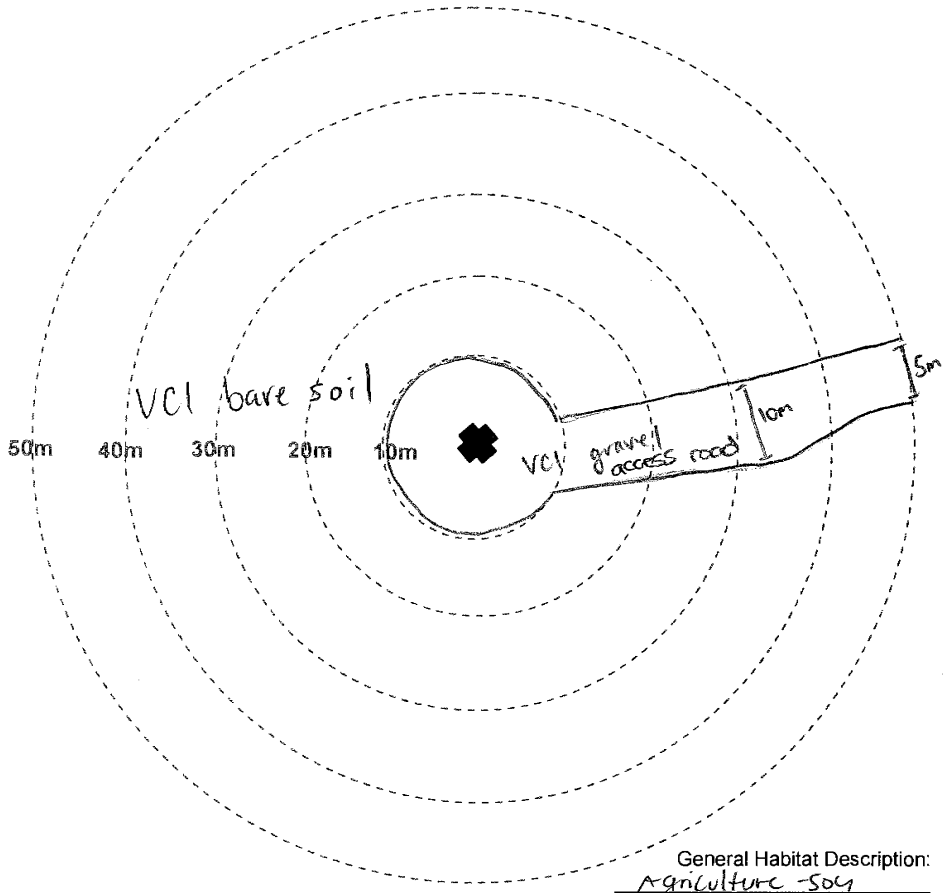
Project Name: Goans Hill WF **Project #:** 18758 **Turbine #:** 04

Photo Numbers (from turbine base)
Facing North: 4546
Facing East: 4547
Facing South: 4548
Facing West: 4549
(sketch habitat and visibility classes)

Date (DD/MM/YY): 25 / 09 / 18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m



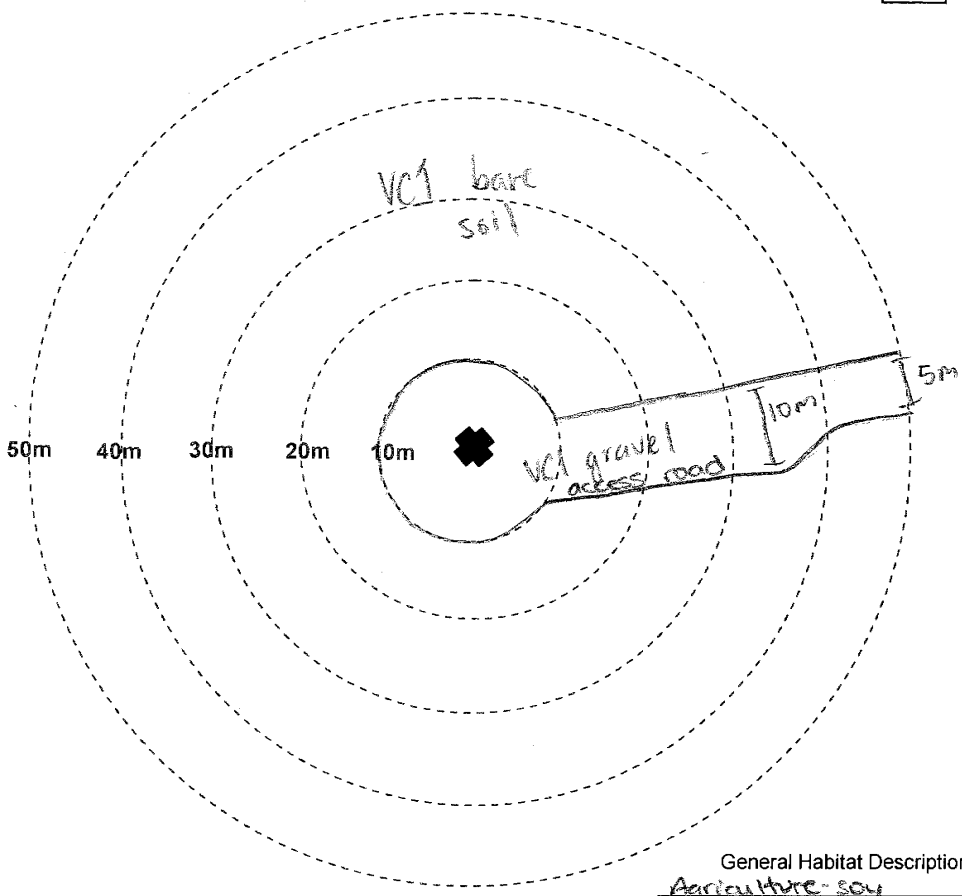
General Habitat Description: Agriculture - soy

Photo Numbers (from turbine base)
Facing North: 4670
Facing East: 4671
Facing South: 4672
Facing West: 4673
(sketch habitat and visibility classes)

Date (DD/MM/YY): 23 / 10 / 18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - soy

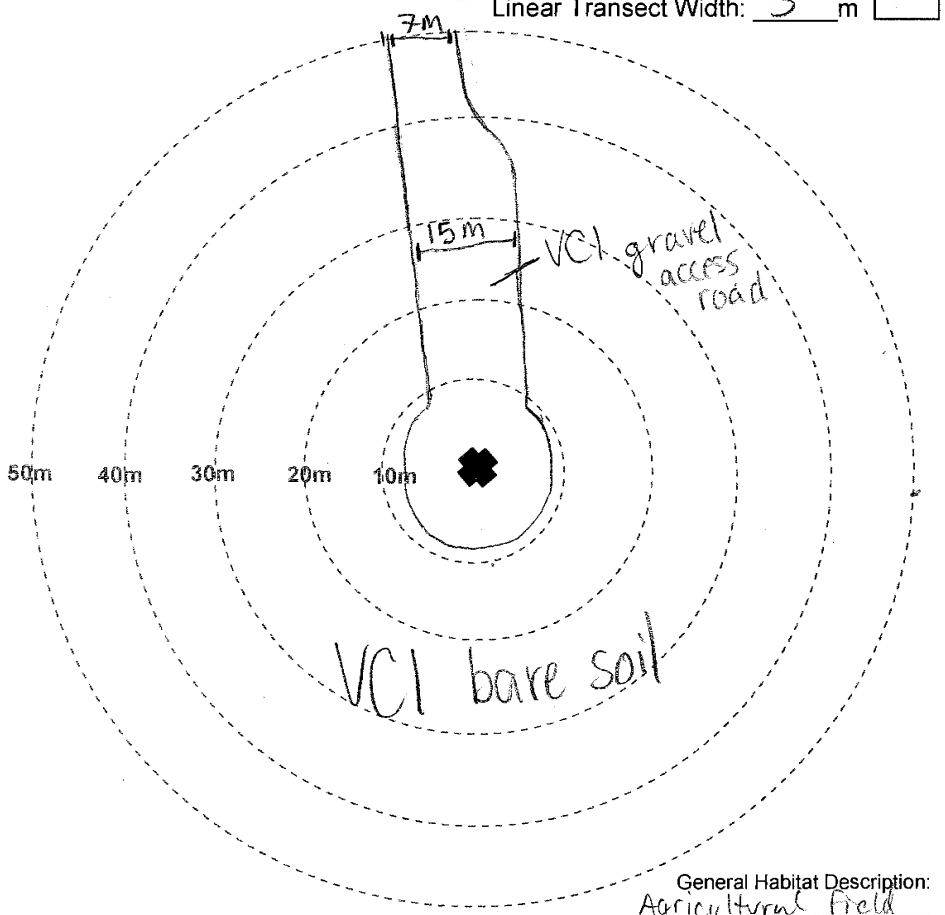
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunn's Hill WF **Project #:** 18758 **Turbine #:** 05 **Degree of Slope** 2 **degrees** **Slope Orientation** S *(e.g. SSW)*

Photo Numbers (from turbine base)
Facing North: 3670
Facing East: 3671
Facing South: 3672
Facing West: 3673
(sketch habitat and visibility classes)

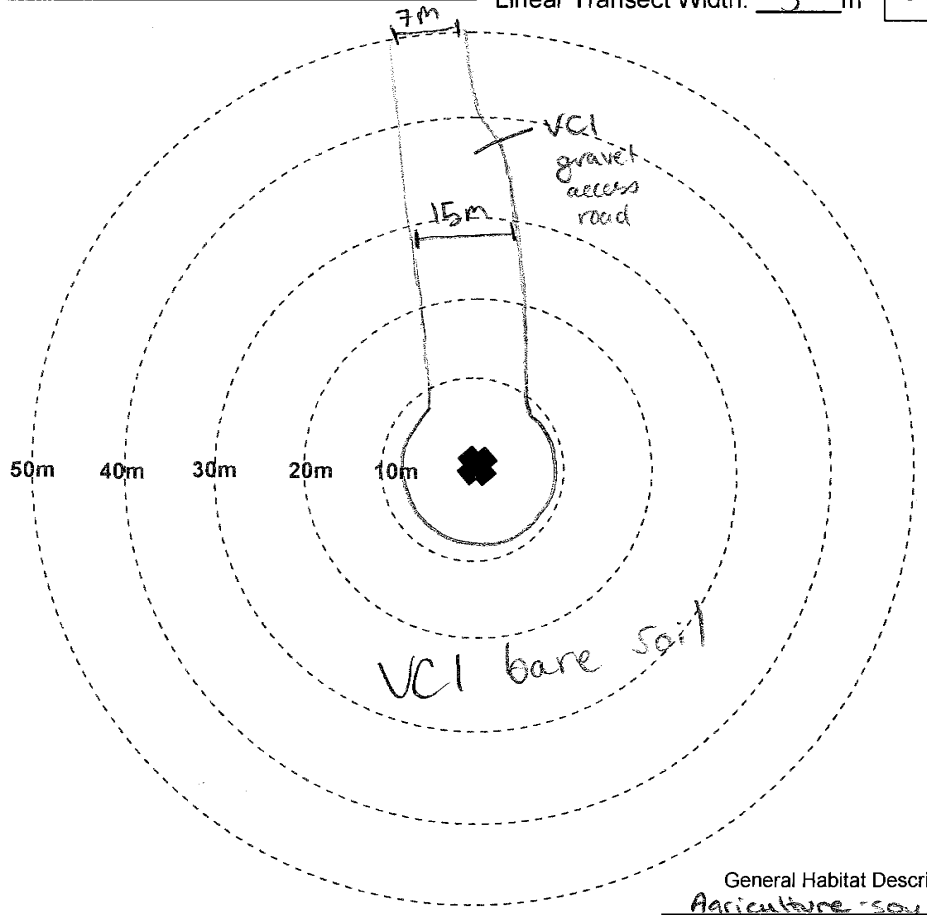
Date (DD/MM/YY): 29/05/18
Observer: GAVIN F.
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agricultural Field

Photo Numbers (from turbine base)
Facing North: 3826
Facing East: 3827
Facing South: 3828
Facing West: 3829
(sketch habitat and visibility classes)

Date (DD/MM/YY): 12/06/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - soy

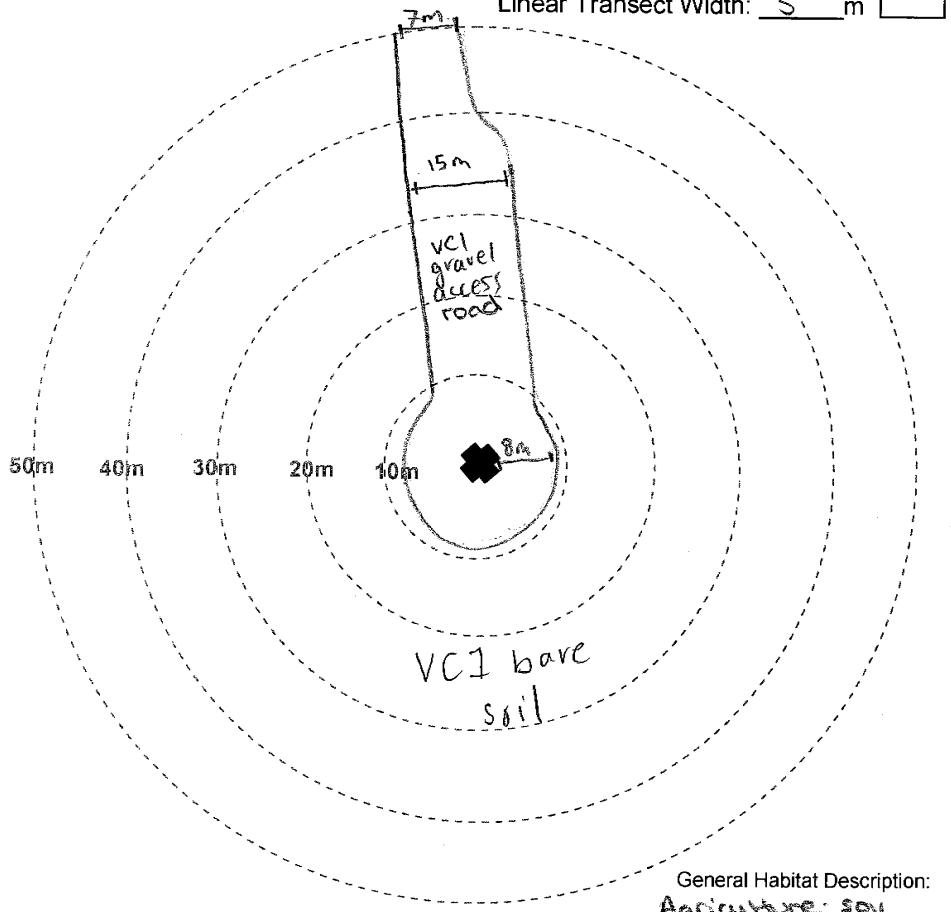
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunn's Hill **Project #:** 18758 **Turbine #:** 05

Photo Numbers (from turbine base)
Facing North: ADS_4053
Facing East: 4054
Facing South: 4055
Facing West: 4056
(sketch habitat and visibility classes)

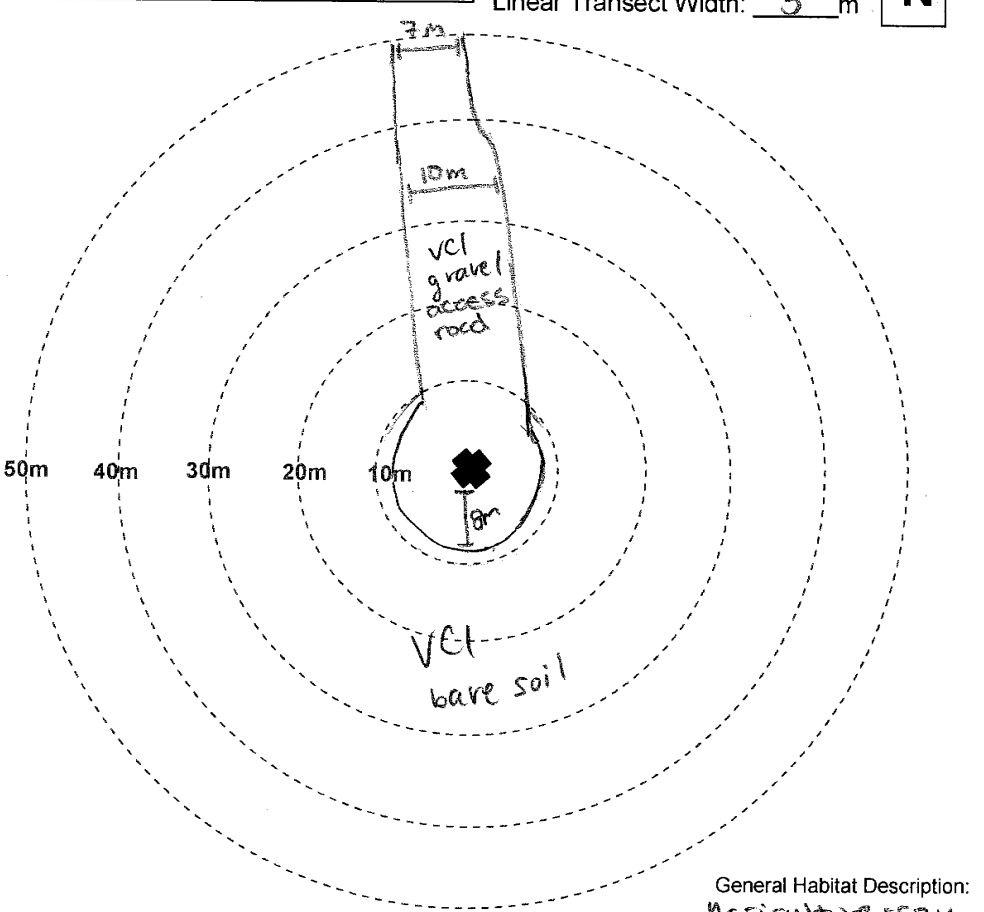
Date (DD/MM/YY): 24 / 07 / 18
Observer: GAVIN F.
Monthly/Seasonal
Linear Transect Width: 5 m



General Habitat Description: Agriculture - soy

Photo Numbers (from turbine base)
Facing North: 4246
Facing East: 4247
Facing South: 4248
Facing West: 4249
(sketch habitat and visibility classes)

Date (DD/MM/YY): 17 / 08 / 18
Observer: Gavin F
Monthly/Seasonal
Linear Transect Width: 5 m



General Habitat Description: Agriculture - soy

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 WF **Project #:** 18758 **Turbine #:** 05

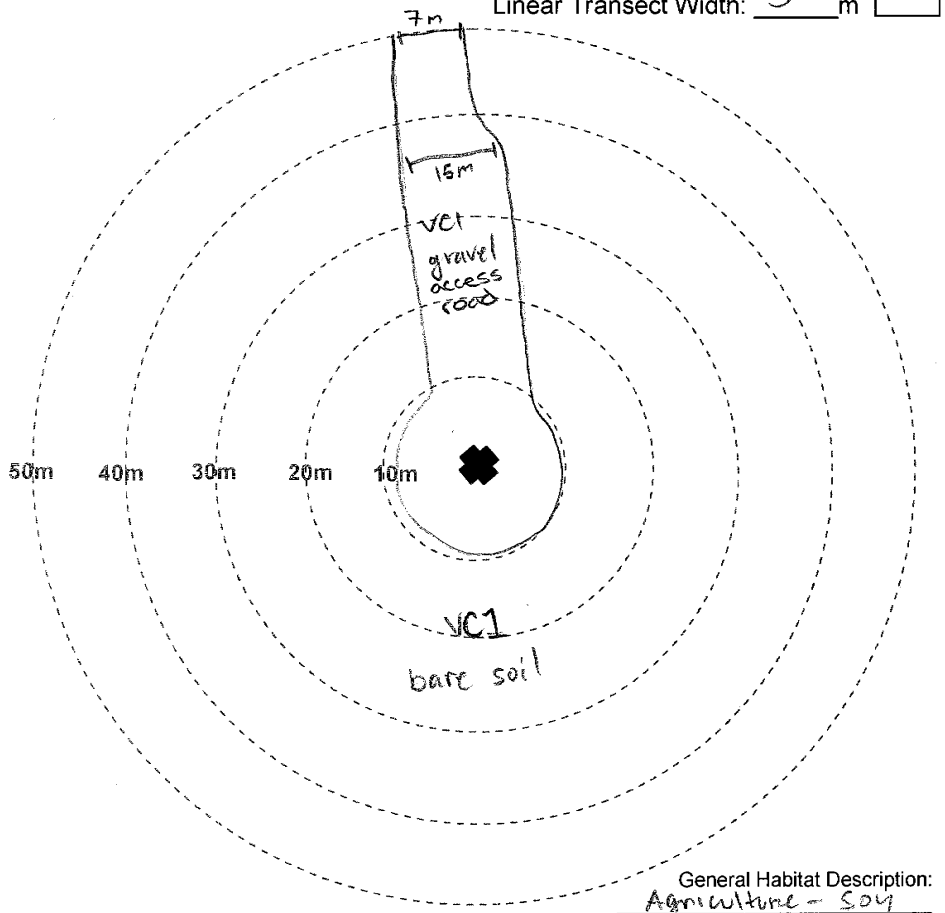
Photo Numbers (from turbine base)
Facing North: 4550
Facing East: 4551
Facing South: 4552
Facing West: 4553
(sketch habitat and visibility classes)

Date (DD/MM/YY): 25/09/18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m

N



General Habitat Description: Agriculture - soy

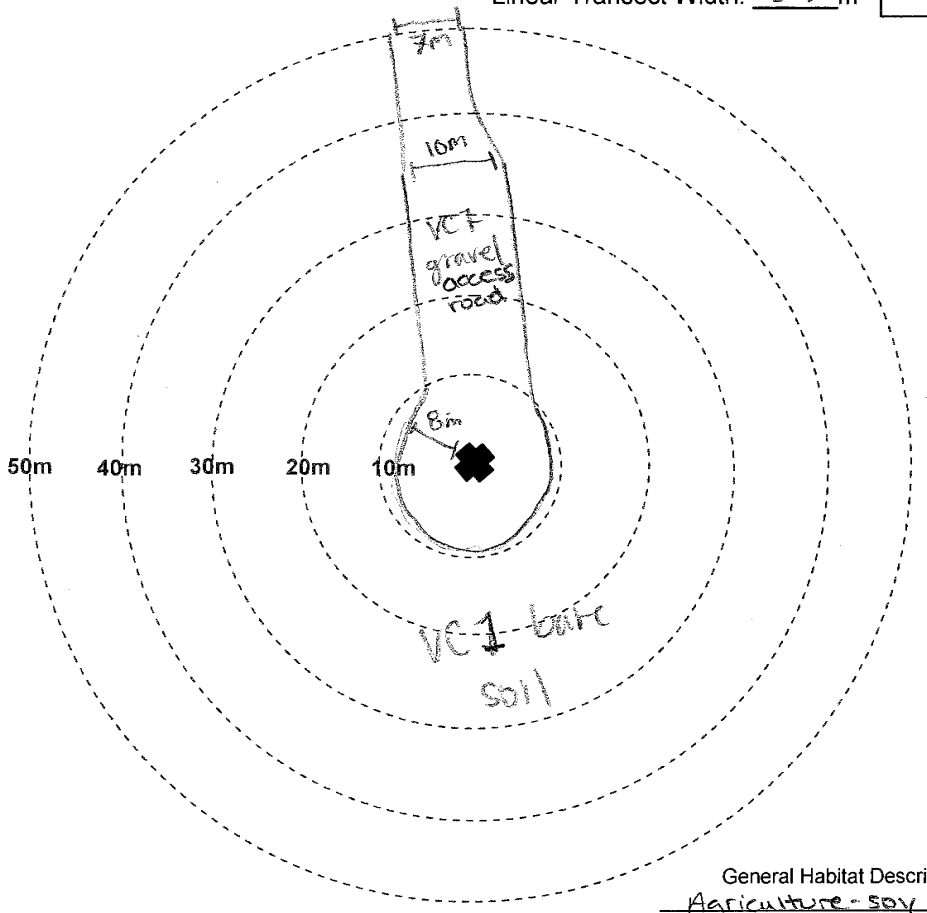
Photo Numbers (from turbine base)
Facing North: 4674
Facing East: 4675
Facing South: 4676
Facing West: 4677
(sketch habitat and visibility classes)

Date (DD/MM/YY): 23/10/18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m

N



General Habitat Description: Agriculture - soy

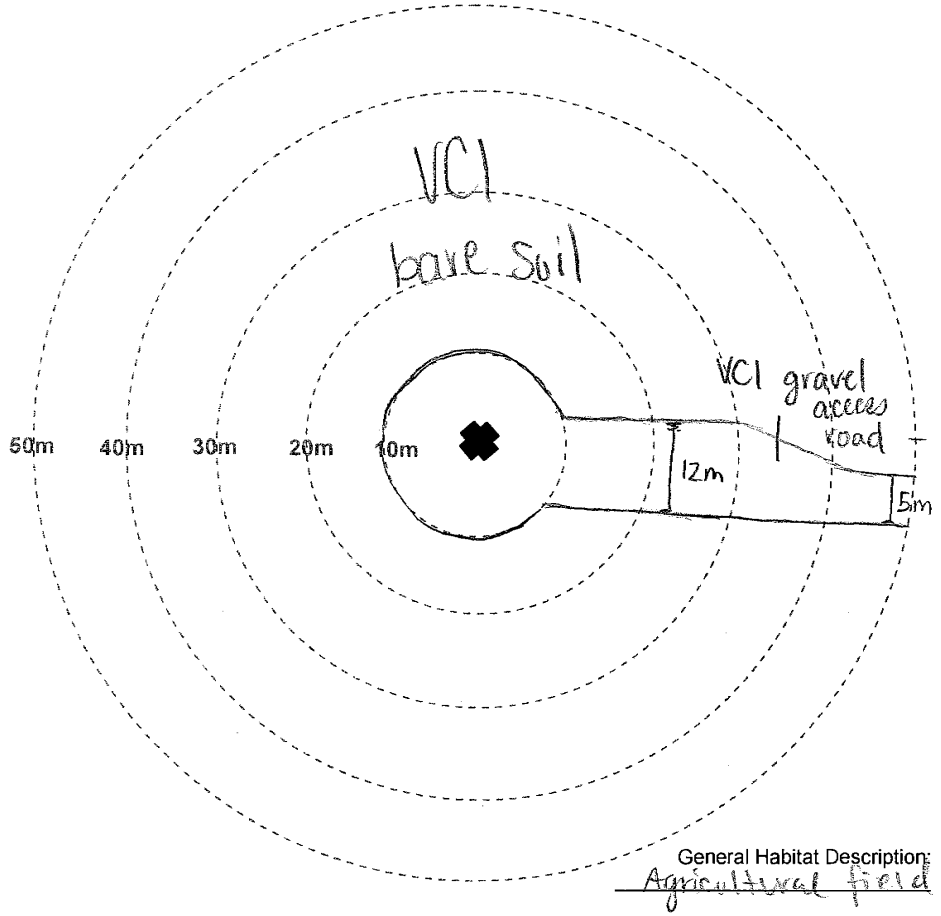
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunns Hill WF **Project #:** 18758 **Turbine #:** 06 **Degree of Slope** 2 **degrees** **Slope Orientation** NE (e.g. SSW)

Photo Numbers (from turbine base)
Facing North: 3655
Facing East: 3656
Facing South: 3657
Facing West: 3658
(sketch habitat and visibility classes)

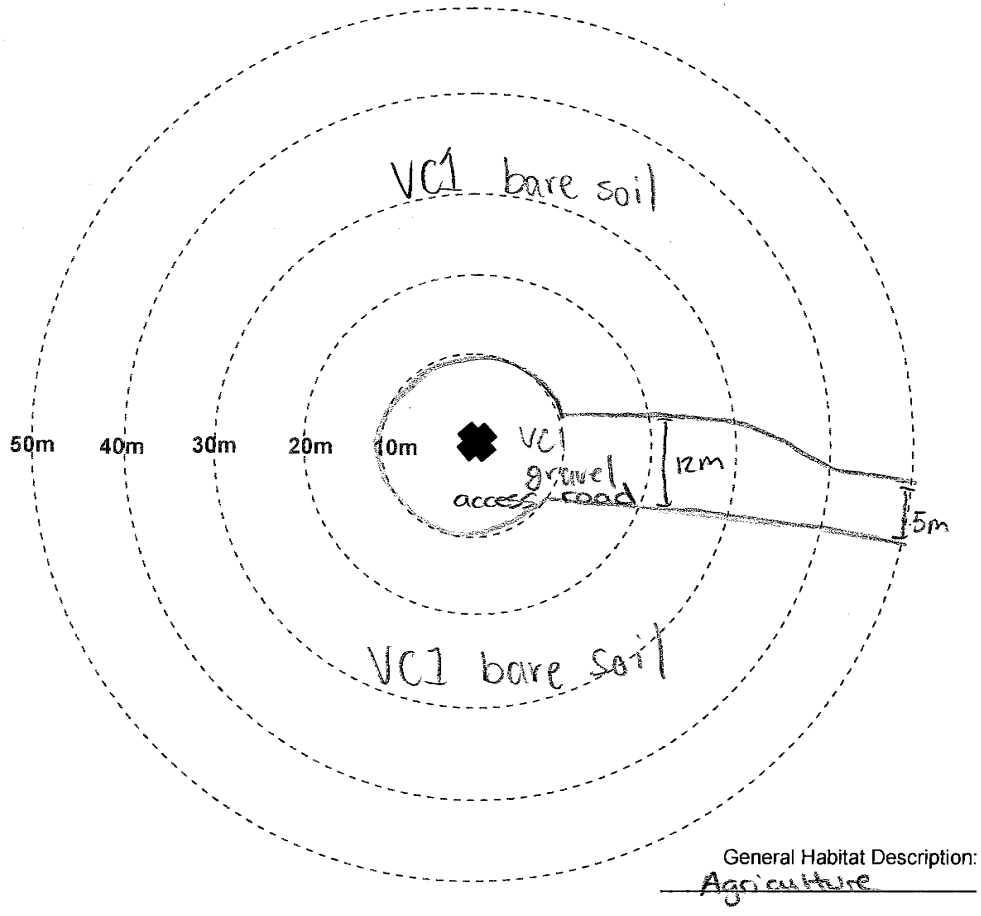
Date (DD/MM/YY): 29/05/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agricultural field

Photo Numbers (from turbine base)
Facing North: 3822
Facing East: 3823
Facing South: 3824
Facing West: 3825
(sketch habitat and visibility classes)

Date (DD/MM/YY): 12/06/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture

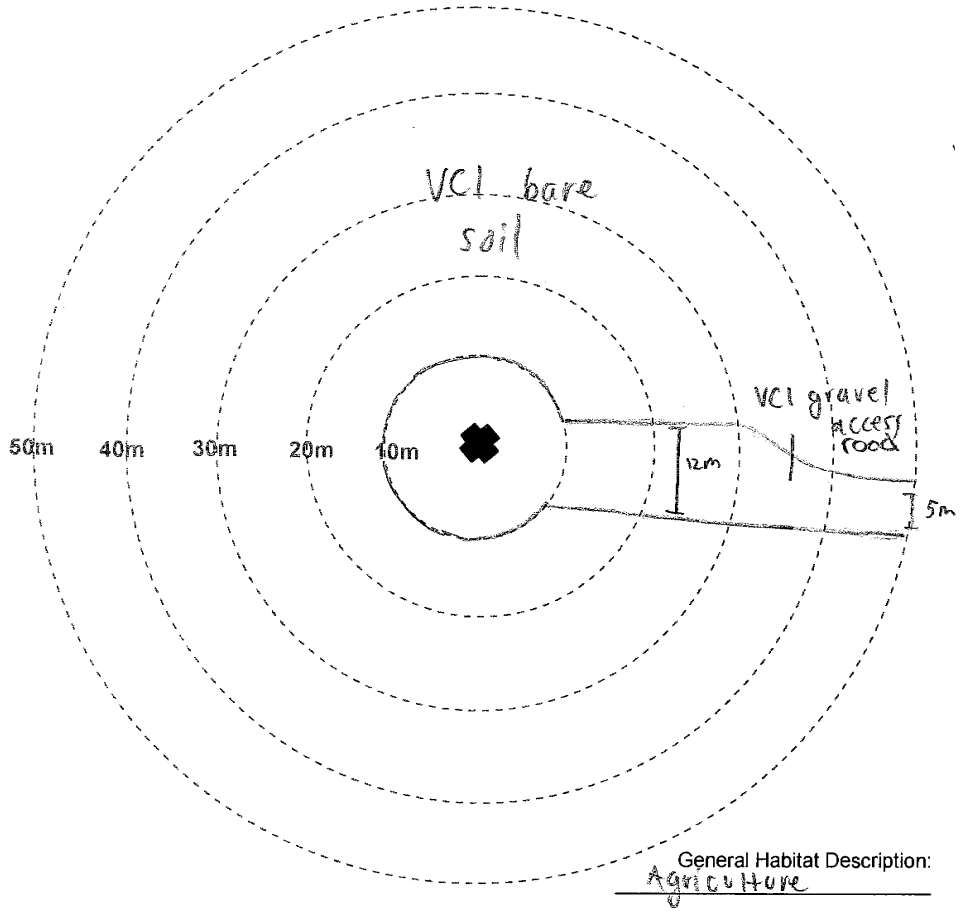
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunn's Hill WF **Project #:** 18758 **Turbine #:** 06

Photo Numbers (from turbine base)
Facing North: 3958
Facing East: 3959
Facing South: 3960
Facing West: 3961
(sketch habitat and visibility classes)

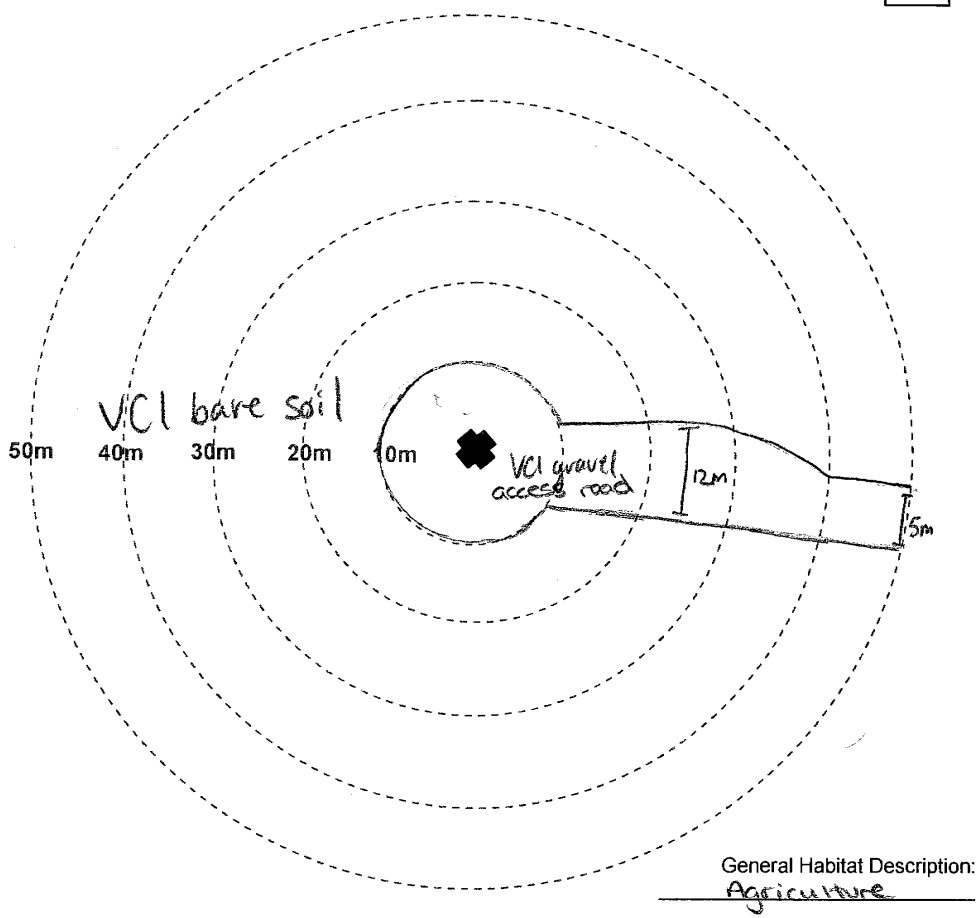
Date (DD/MM/YY): 24/07/18
Observer: GAVIN F.
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture

Photo Numbers (from turbine base)
Facing North: 4242
Facing East: 4243
Facing South: 4244
Facing West: 4245
(sketch habitat and visibility classes)

Date (DD/MM/YY): 17/08/18
Observer: Gavin F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture

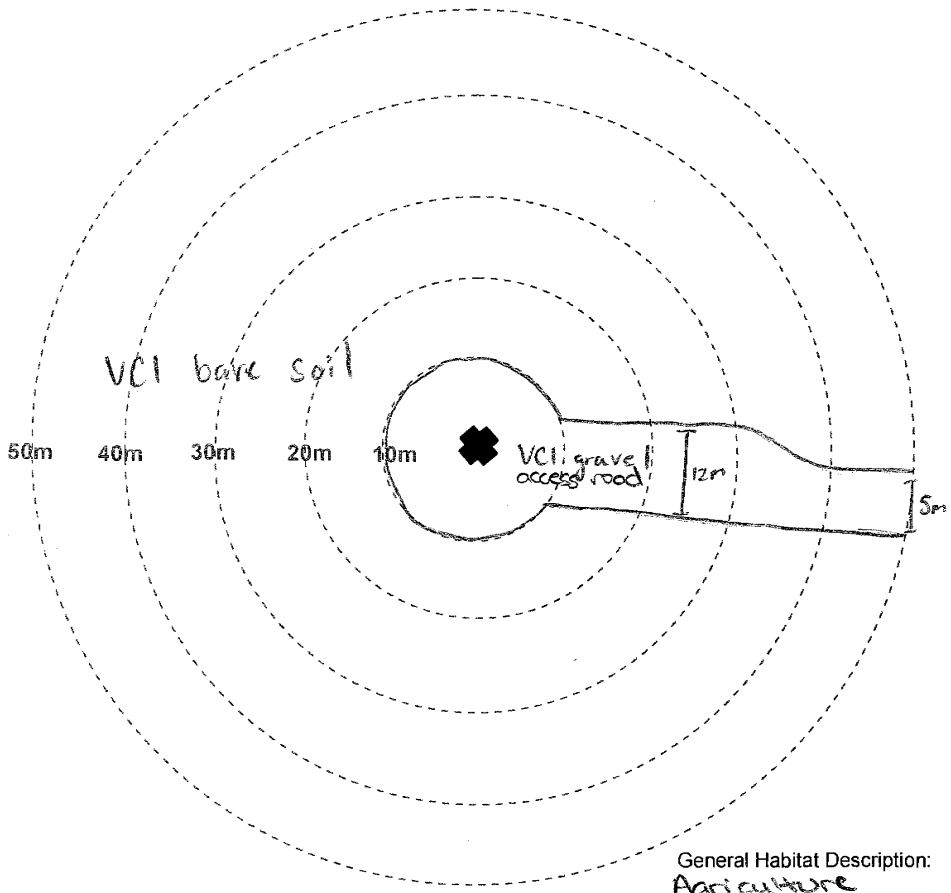
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunn's Hill WF **Project #:** 18758 **Turbine #:** 06

Photo Numbers (from turbine base)
Facing North: 4542
Facing East: 4543
Facing South: 4544
Facing West: 4545
(sketch habitat and visibility classes)

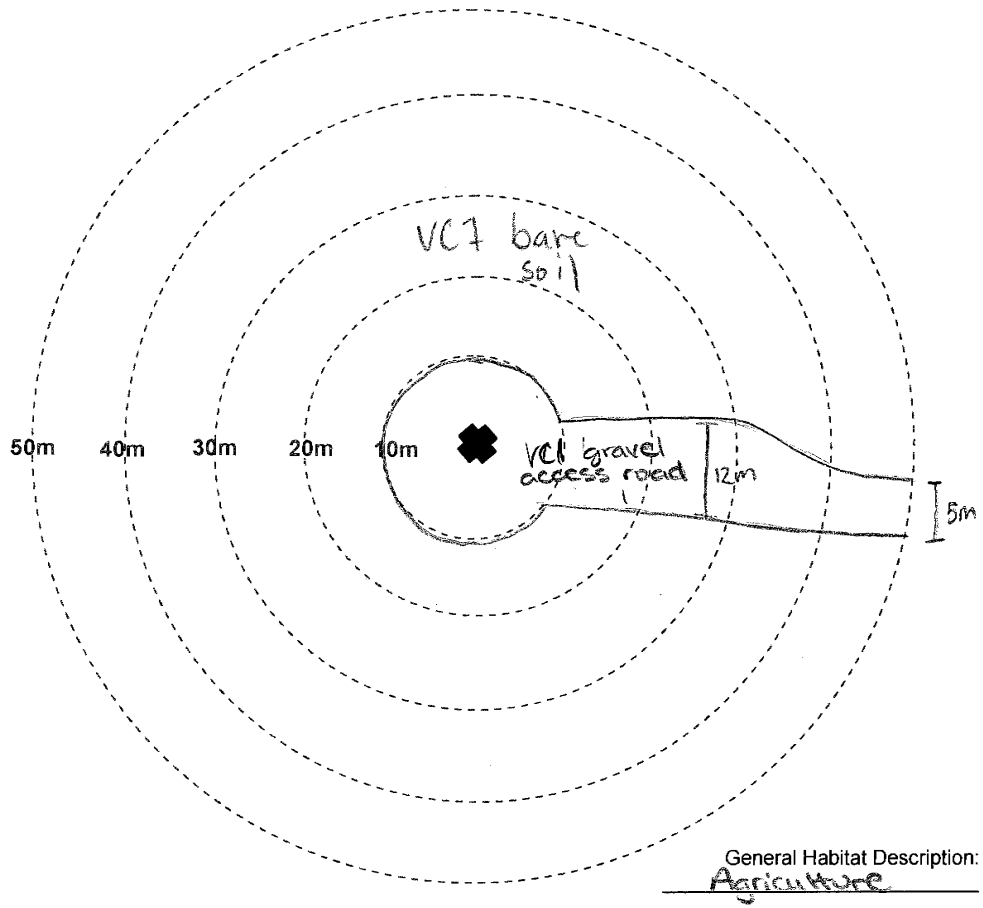
Date (DD/MM/YY): 29/09/18
Observer: Gavin F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture

Photo Numbers (from turbine base)
Facing North: 46666
Facing East: 46667
Facing South: 46668
Facing West: 46669
(sketch habitat and visibility classes)

Date (DD/MM/YY): 23/10/18
Observer: Gavin F.
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture

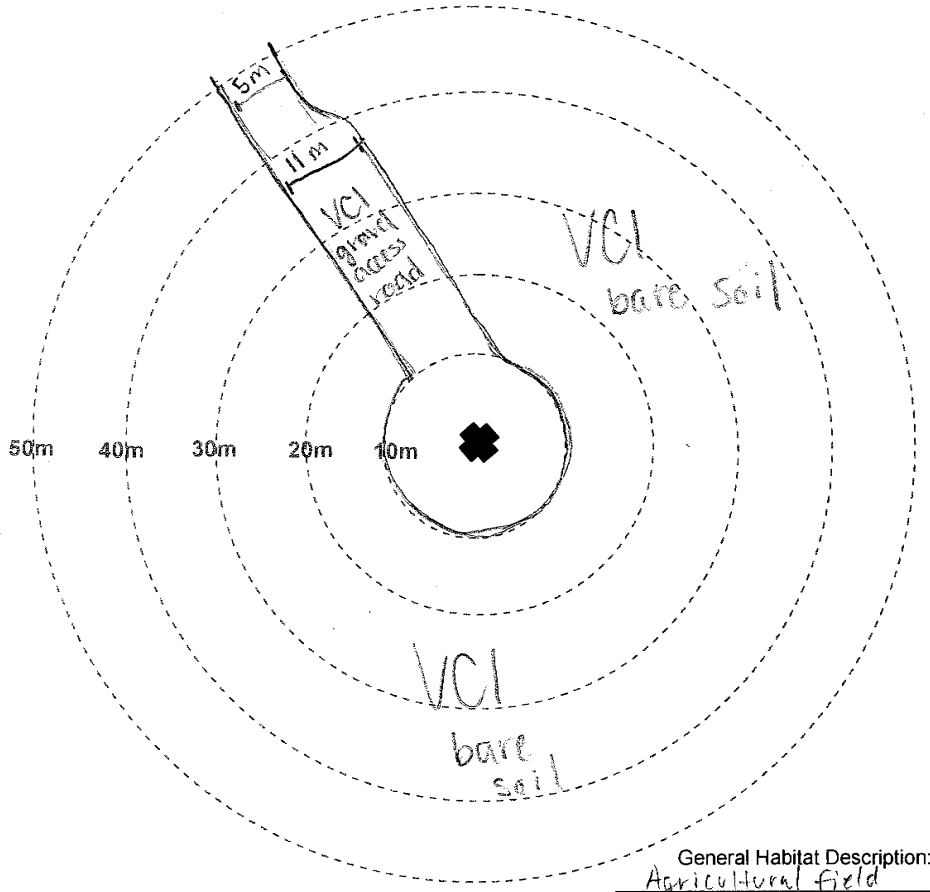
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunn's Hill WF **Project #:** 18158 **Turbine #:** 07 **Degree of Slope** 2 **degrees** **Slope Orientation** SW (e.g. SSW)

Photo Numbers (from turbine base)
Facing North: 3659
Facing East: 3660
Facing South: 3661
Facing West: 3662
(sketch habitat and visibility classes)

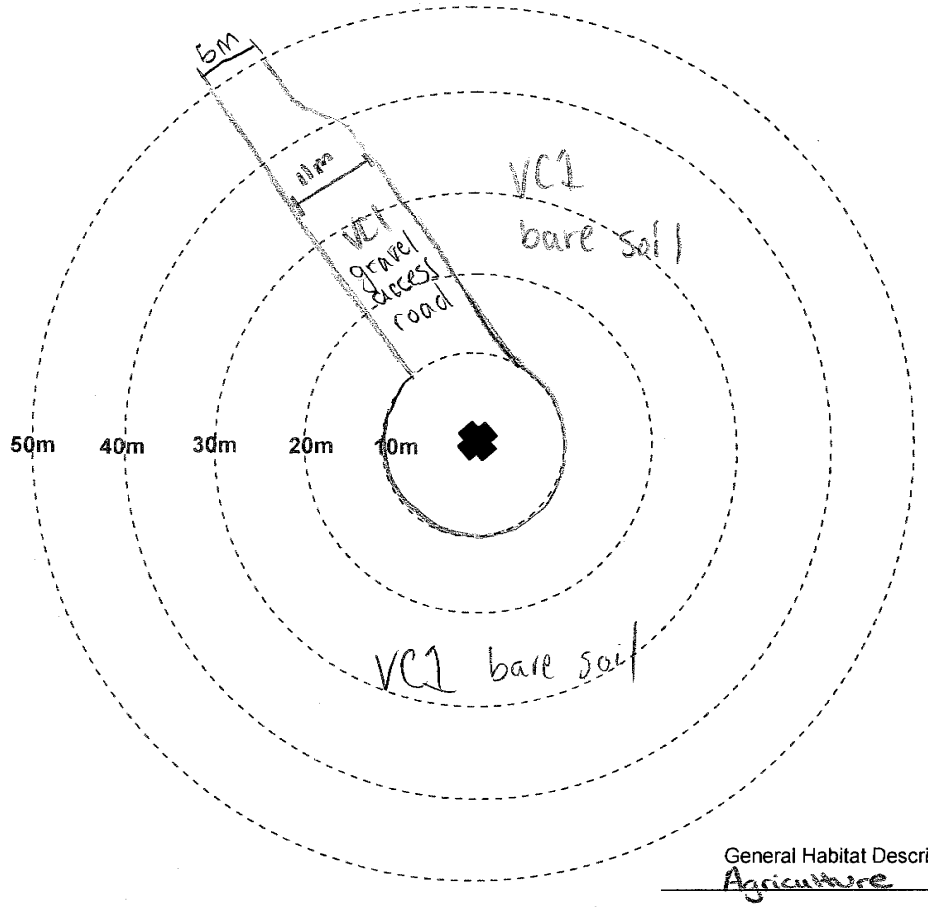
Date (DD/MM/YY): 29/05/18
Observer: GAVIN F.
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agricultural field

Photo Numbers (from turbine base)
Facing North: 3818
Facing East: 3819
Facing South: 3820
Facing West: 3821
(sketch habitat and visibility classes)

Date (DD/MM/YY): 12/06/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture

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

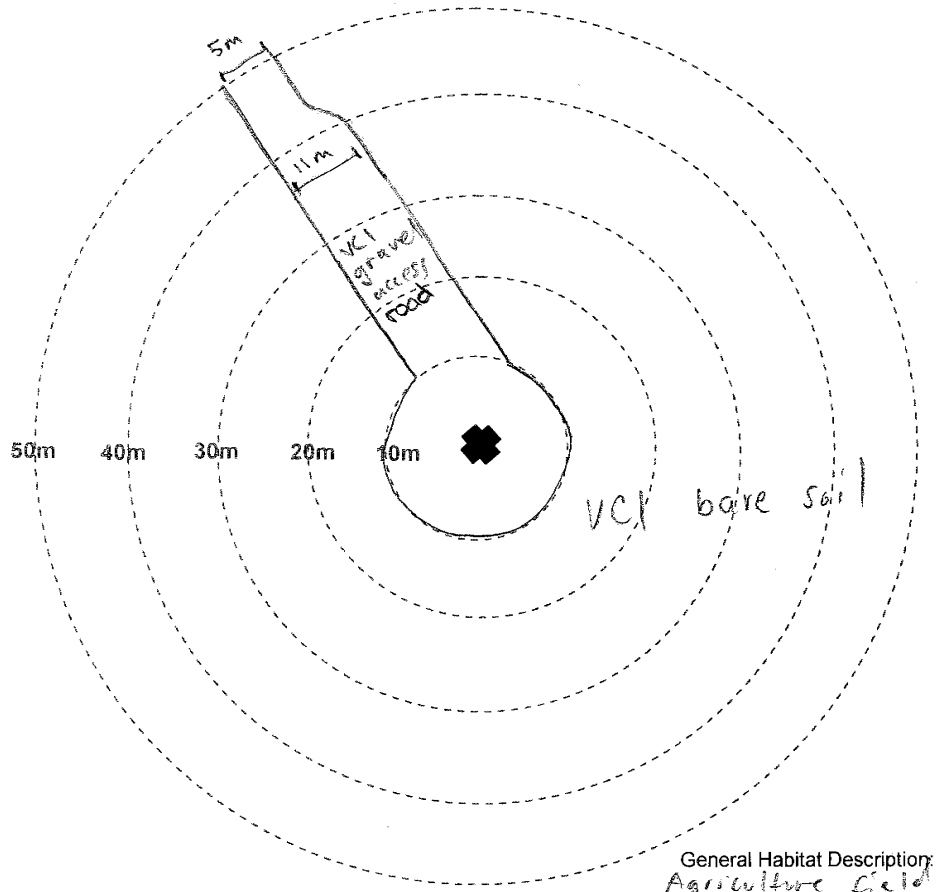
Project Name: Gunns Hill WF **Project #:** 18758 **Turbine #:** 07

Photo Numbers (from turbine base)
Facing North: 3954
Facing East: 3955
Facing South: 3956
Facing West: 3957
(sketch habitat and visibility classes)

Date (DD/MM/YY): 24 / 07 / 18

Observer: GAVIN F

Monthly/Seasonal Linear Transect Width: 5 m



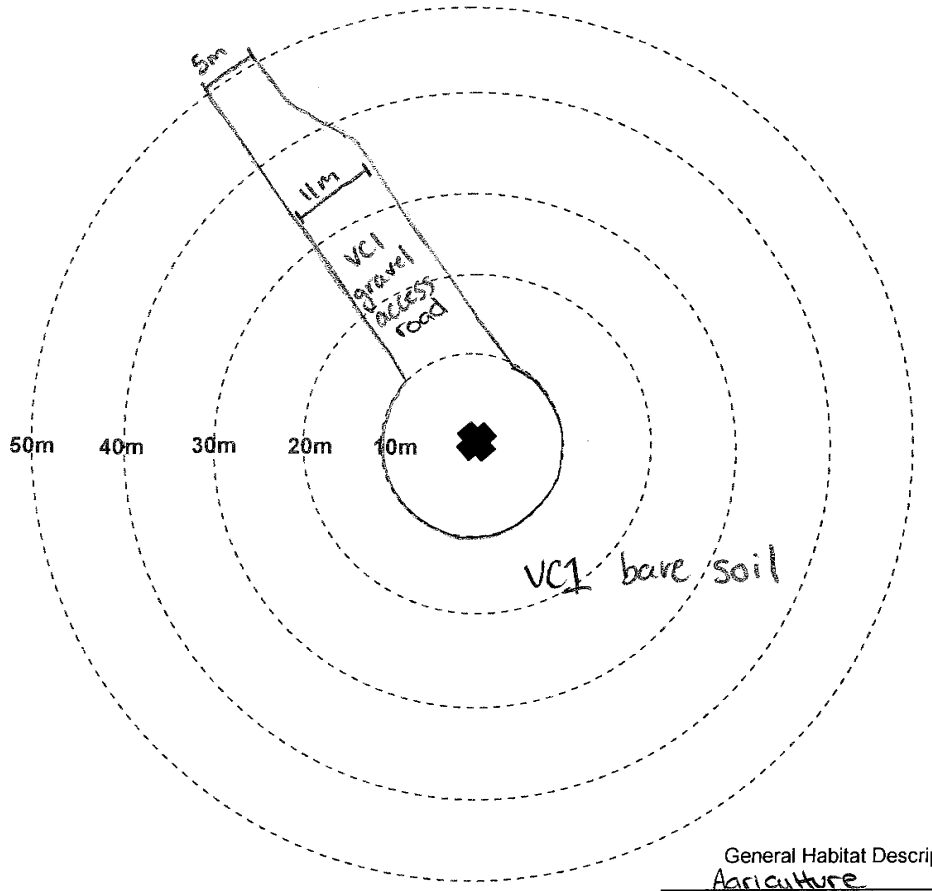
General Habitat Description: Agriculture field

Photo Numbers (from turbine base)
Facing North: 4238
Facing East: 4239
Facing South: 4240
Facing West: 4241
(sketch habitat and visibility classes)

Date (DD/MM/YY): 17 / 08 / 18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture

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

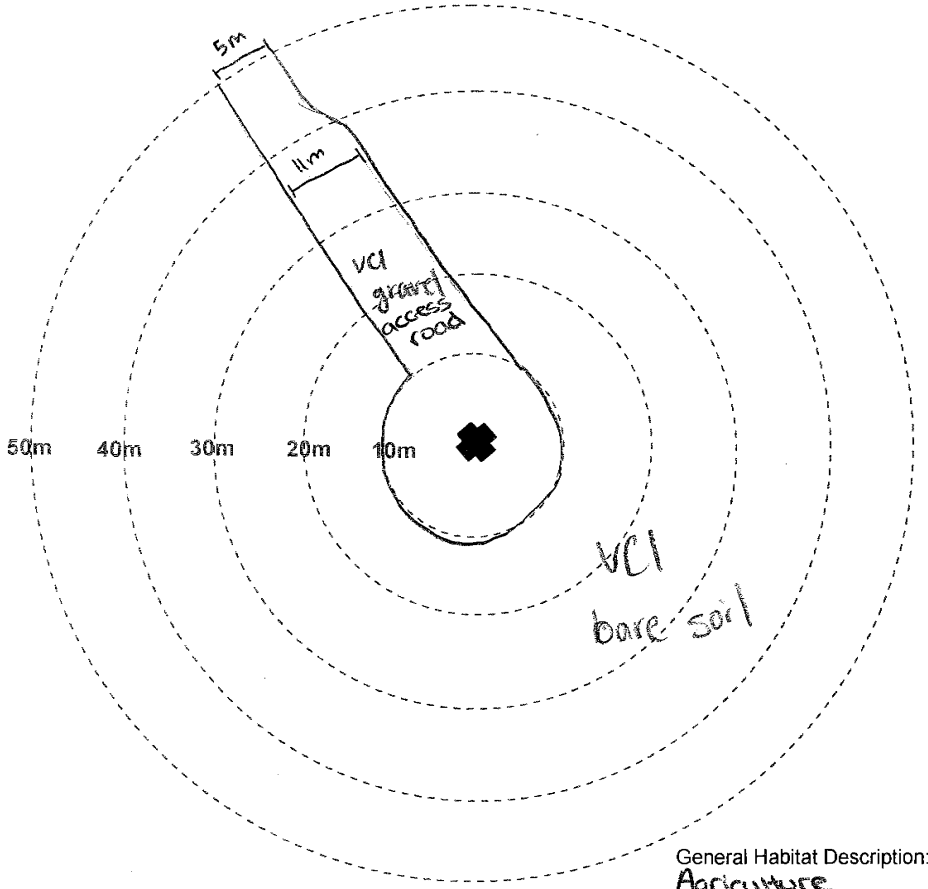
Project Name: Gunns Hill WF **Project #:** 18758 **Turbine #:** 07

Photo Numbers (from turbine base)
Facing North: 4538
Facing East: 4539
Facing South: 4540
Facing West: 4541
(sketch habitat and visibility classes)

Date (DD/MM/YY): 29 / 09 / 18

Observer: Gavin F

Monthly/Seasonal
Linear Transect Width: 5 m



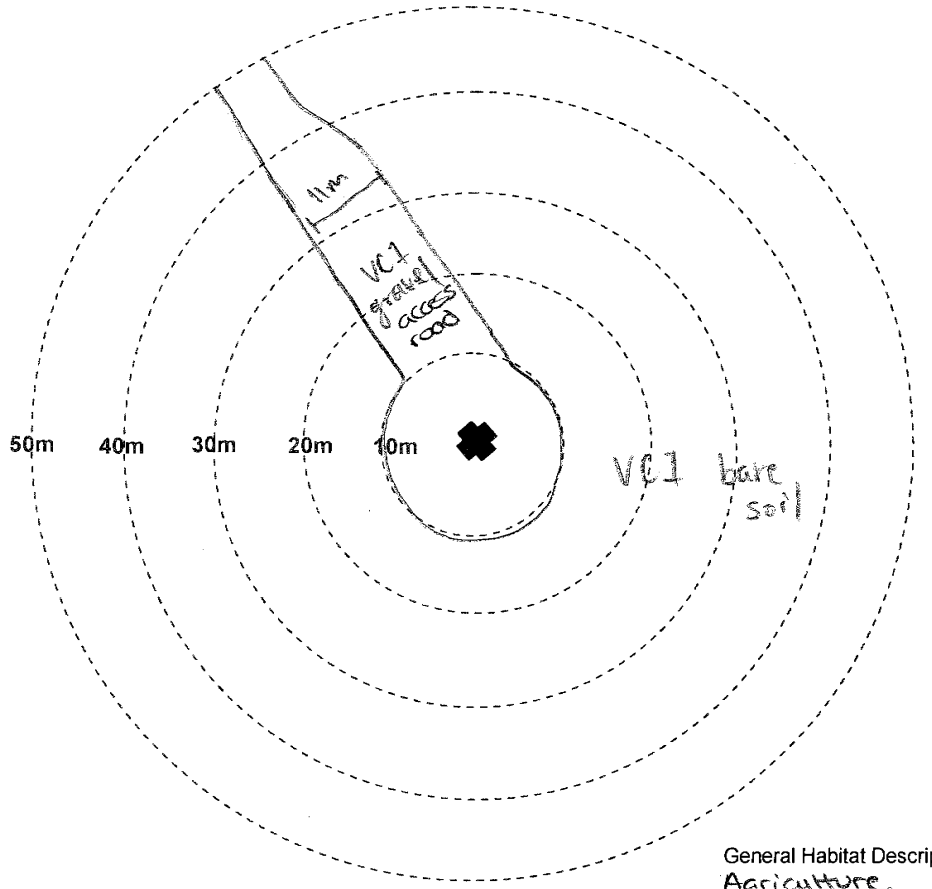
General Habitat Description:
Agriculture

Photo Numbers (from turbine base)
Facing North: 41662
Facing East: 41663
Facing South: 41664
Facing West: 41665
(sketch habitat and visibility classes)

Date (DD/MM/YY): 23 / 10 / 18

Observer: Gavin F

Monthly/Seasonal
Linear Transect Width: 5 m



General Habitat Description:
Agriculture

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

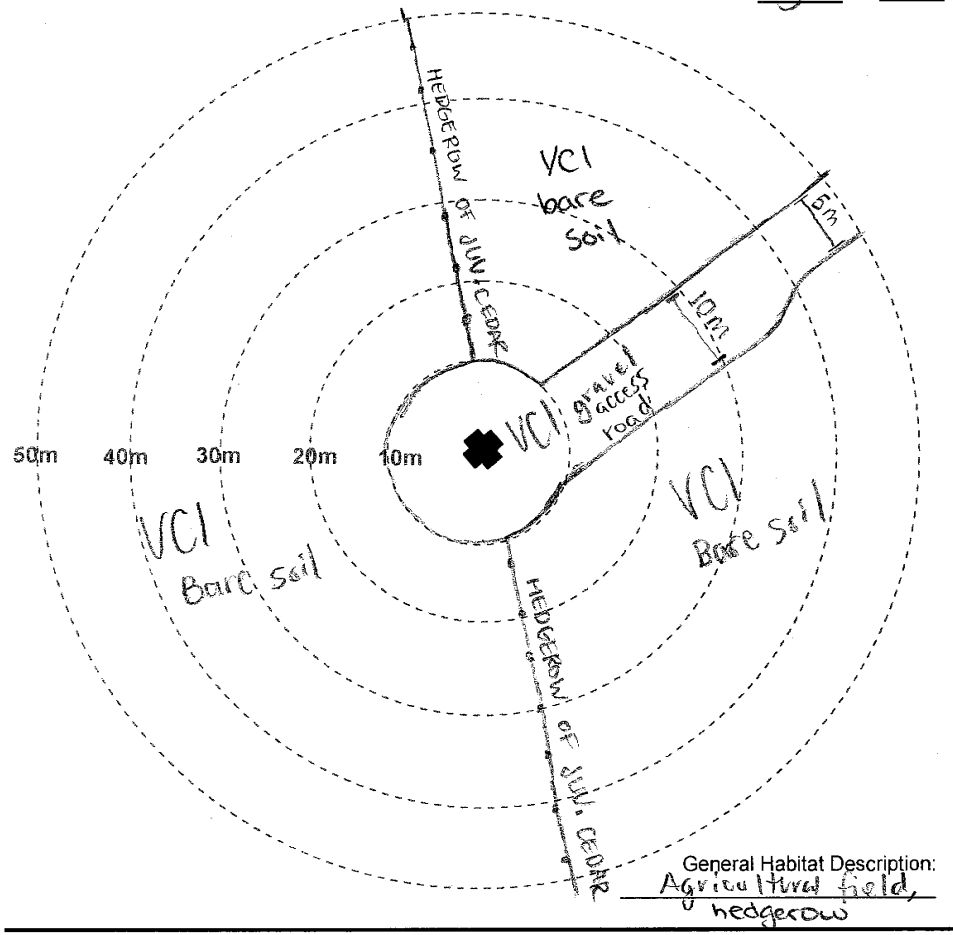
Project Name: Gunn's Hill WF **Project #:** 1875B **Turbine #:** 08 **Degree of Slope** 4 **degrees** **Slope Orientation** S (e.g. SSW)

Photo Numbers (from turbine base)
Facing North: 3674
Facing East: 3675
Facing South: 3676
Facing West: 3677
(sketch habitat and visibility classes)

Date (DD/MM/YY): 29/05/18

Observer: GAVIN F

Monthly/Seasonal Linear Transect Width: 5 m



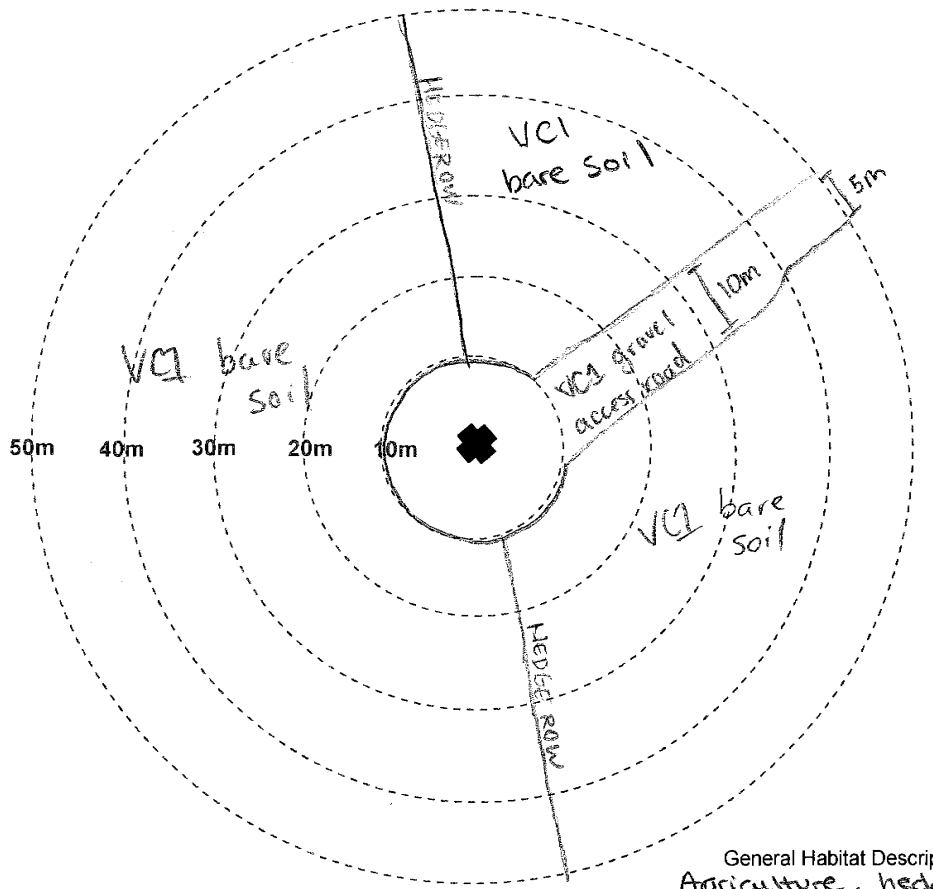
General Habitat Description: Agricultural field, hedgerow

Photo Numbers (from turbine base)
Facing North: 3834
Facing East: 3835
Facing South: 3836
Facing West: 3837
(sketch habitat and visibility classes)

Date (DD/MM/YY): 12/06/18

Observer: GAVIN F

Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture, 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: Gunns Hill WF **Project #:** 18758 **Turbine #:** 08

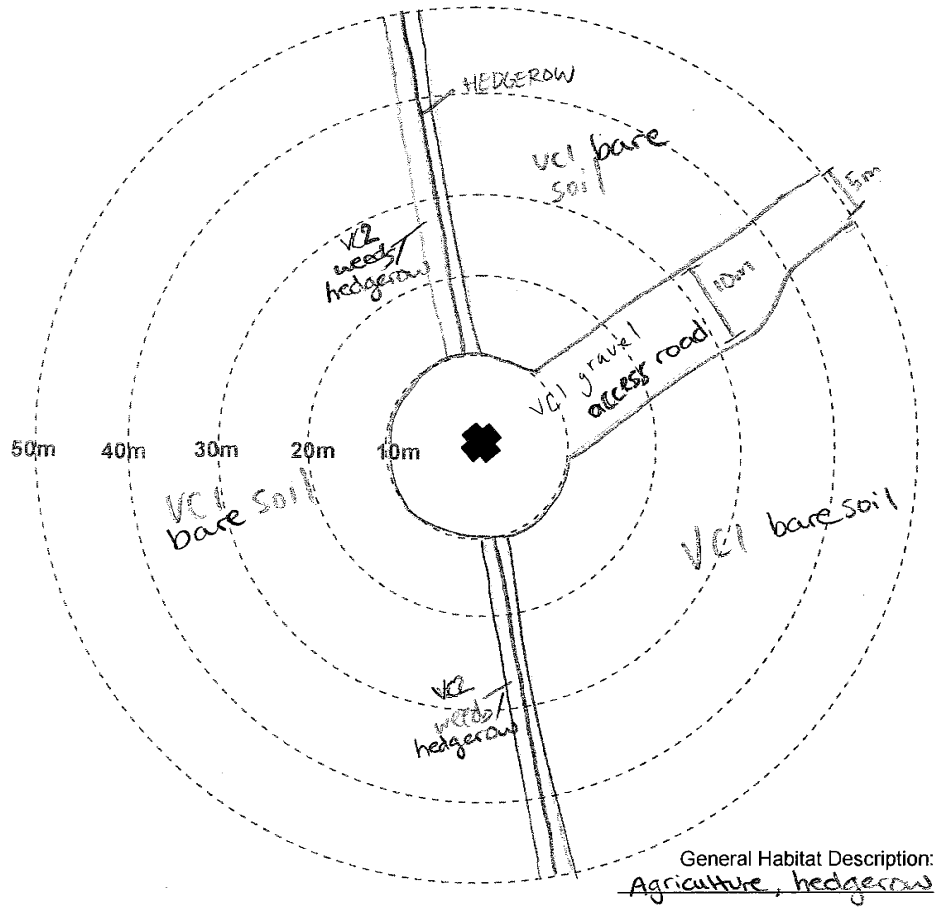
Photo Numbers (from turbine base)
Facing North: ADS_4068
Facing East: 4069
Facing South: 4070
Facing West: 4071
(sketch habitat and visibility classes)

Date (DD/MM/YY): 24/07/18

Observer: GAVIN F

Monthly/Seasonal Linear Transect Width: 5 m

N



General Habitat Description: Agriculture, hedgerow

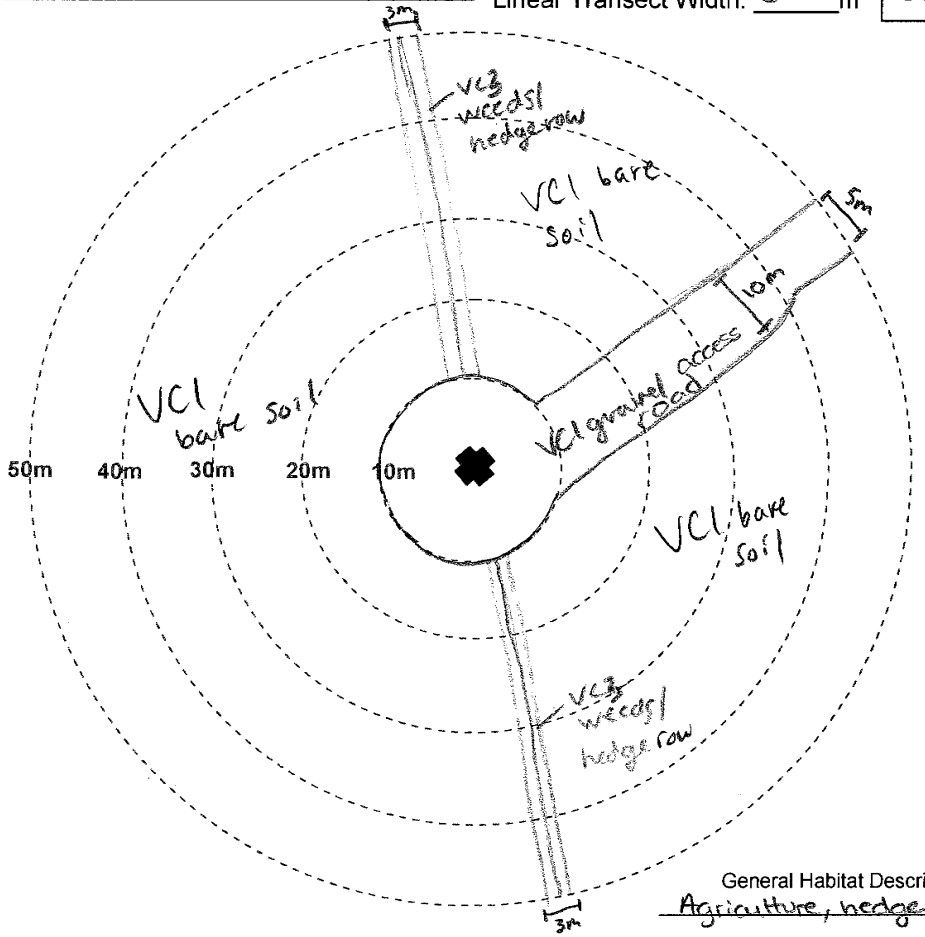
Photo Numbers (from turbine base)
Facing North: 4258
Facing East: 4259
Facing South: 4260
Facing West: 4261
(sketch habitat and visibility classes)

Date (DD/MM/YY): 17/08/18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m

N



General Habitat Description: Agriculture, 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

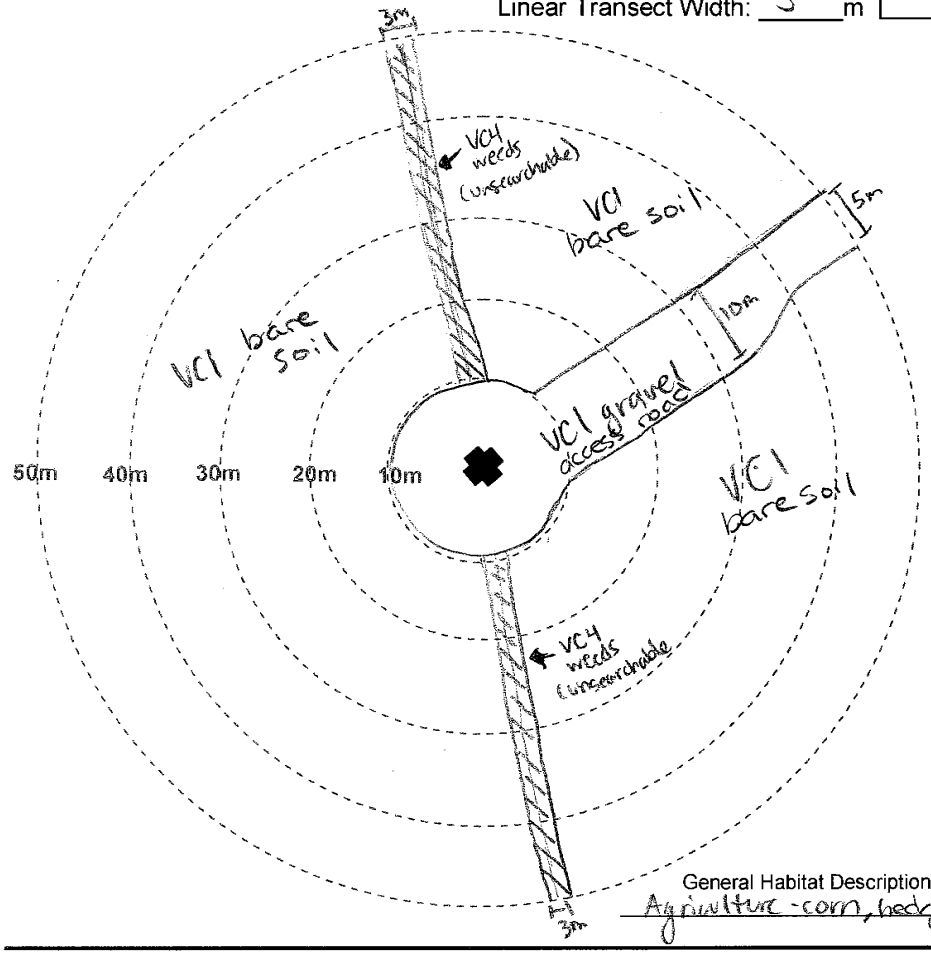
Project Name: Gunns Hill WF **Project #:** 18758 **Turbine #:** 08

Photo Numbers (from turbine base)
Facing North: 4554
Facing East: 4555
Facing South: 4556
Facing West: 4557
(sketch habitat and visibility classes)

Date (DD/MM/YY): 25 / 09 / 18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m



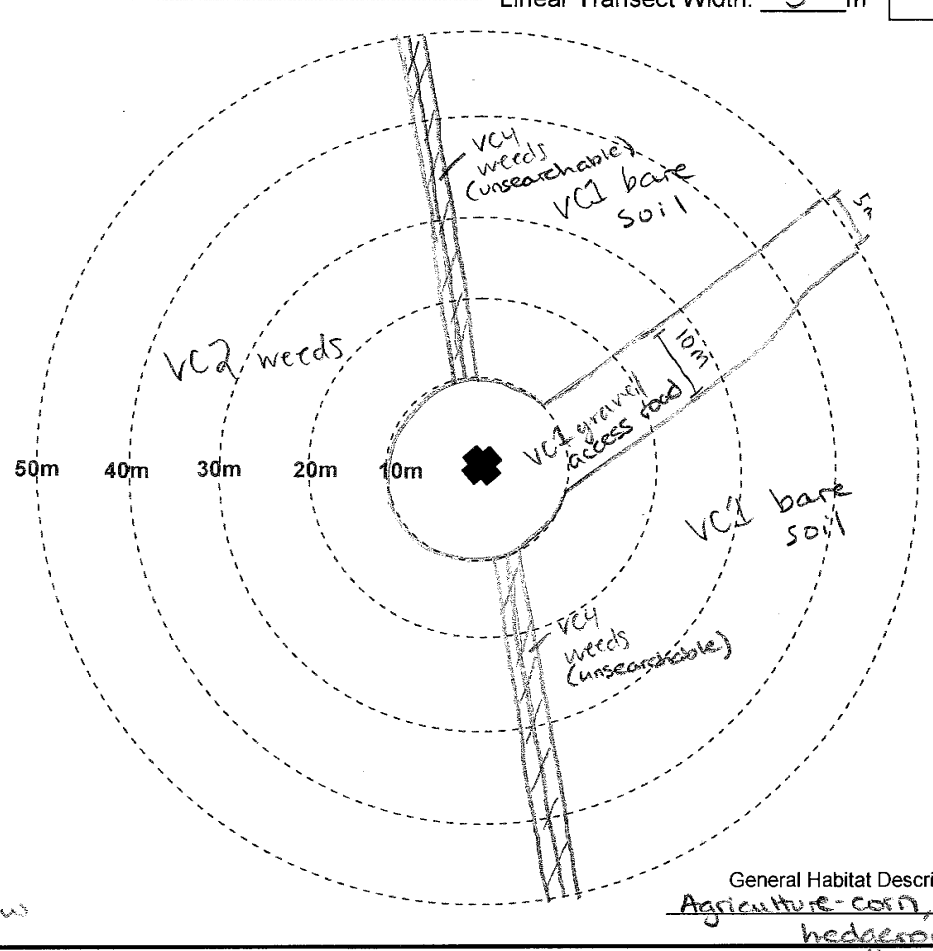
General Habitat Description: Agriculture - corn, hedgerows

Photo Numbers (from turbine base)
Facing North: 4678
Facing East: 4679
Facing South: 4680
Facing West: 4681
(sketch habitat and visibility classes)

Date (DD/MM/YY): 23 / 10 / 18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - corn, hedgerows

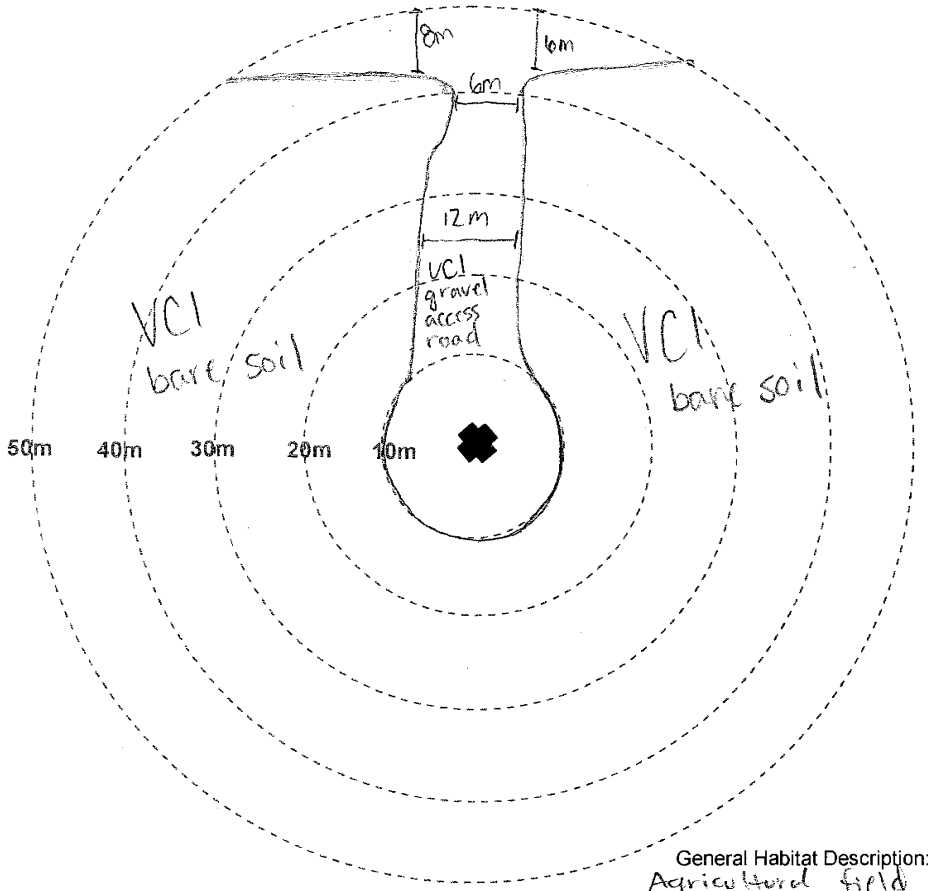
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunn's Hill WF **Project #:** 1875B **Turbine #:** 09 **Degree of Slope** 2 **degrees** **Slope Orientation** ESE (e.g. SSW)

Photo Numbers (from turbine base)
Facing North: 3678
Facing East: 3679
Facing South: 3680
Facing West: 3681
(sketch habitat and visibility classes)

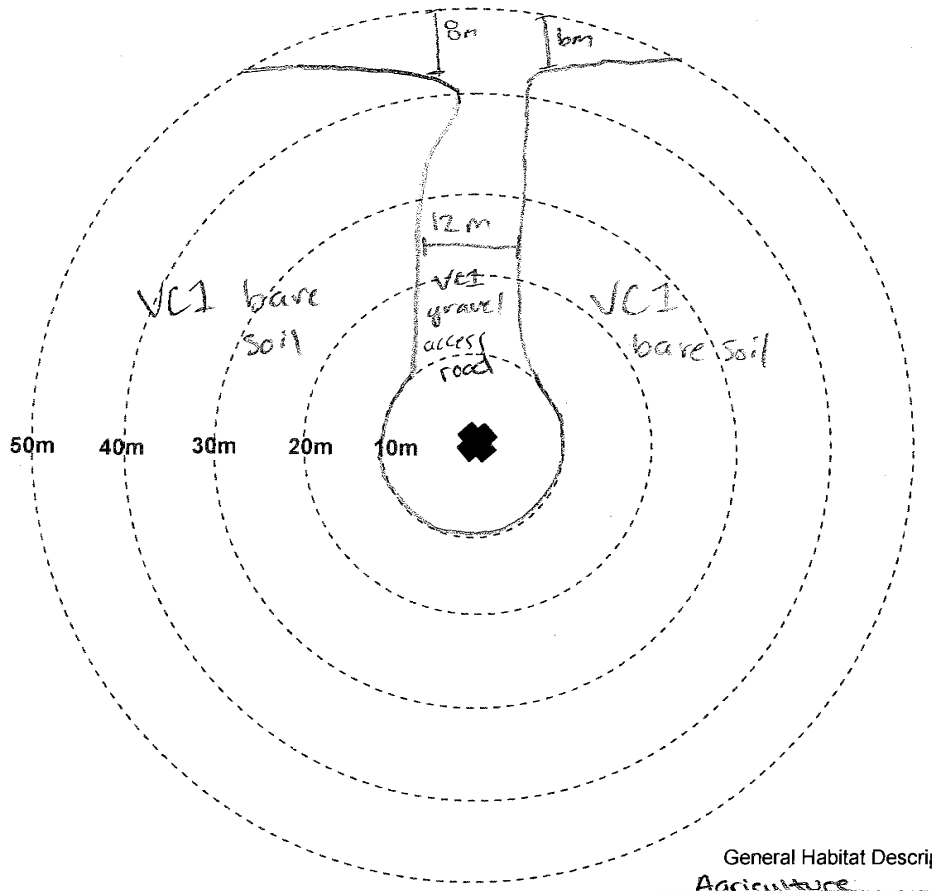
Date (DD/MM/YY): 29/05/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agricultural field

Photo Numbers (from turbine base)
Facing North: 3838
Facing East: 3839
Facing South: 3840
Facing West: 3841
(sketch habitat and visibility classes)

Date (DD/MM/YY): 12/06/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture

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

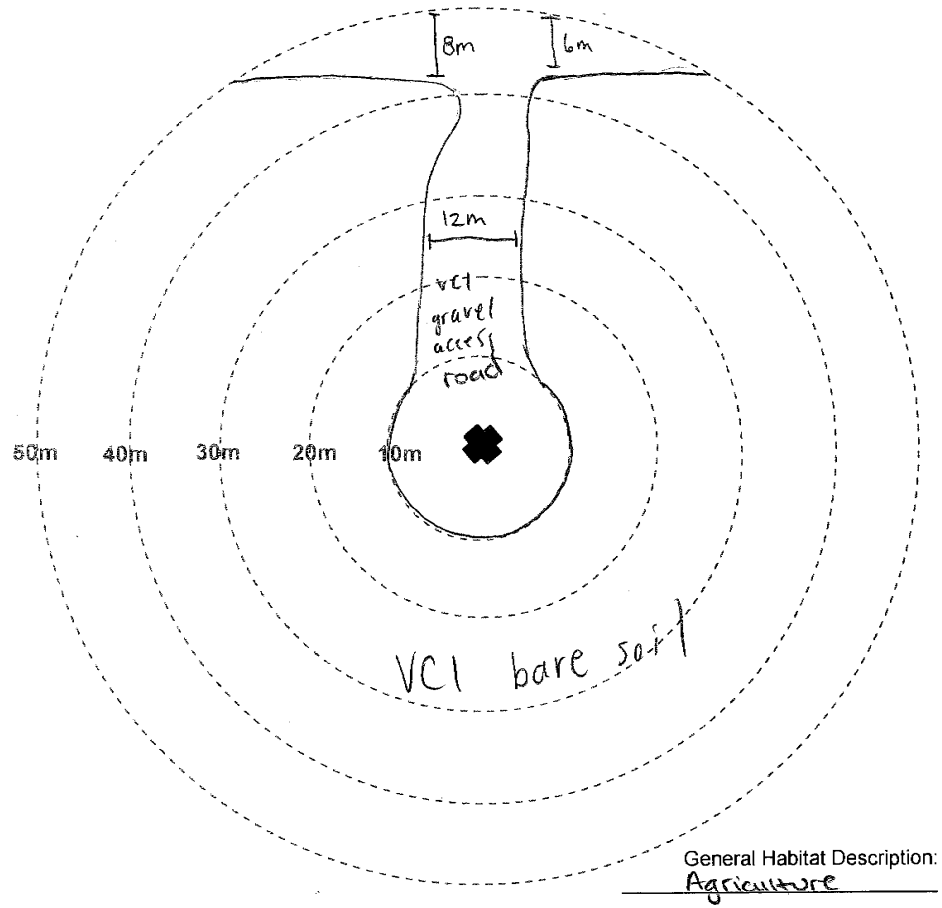
Project Name: Gunn's Hill WF **Project #:** 1875B **Turbine #:** 09

Photo Numbers (from turbine base)
Facing North: ADS_4073
Facing East: 4074
Facing South: 4075
Facing West: 4076
(sketch habitat and visibility classes)

Date (DD/MM/YY): 24/07/18

Observer: GAVIN F.

Monthly/Seasonal Linear Transect Width: 5 m



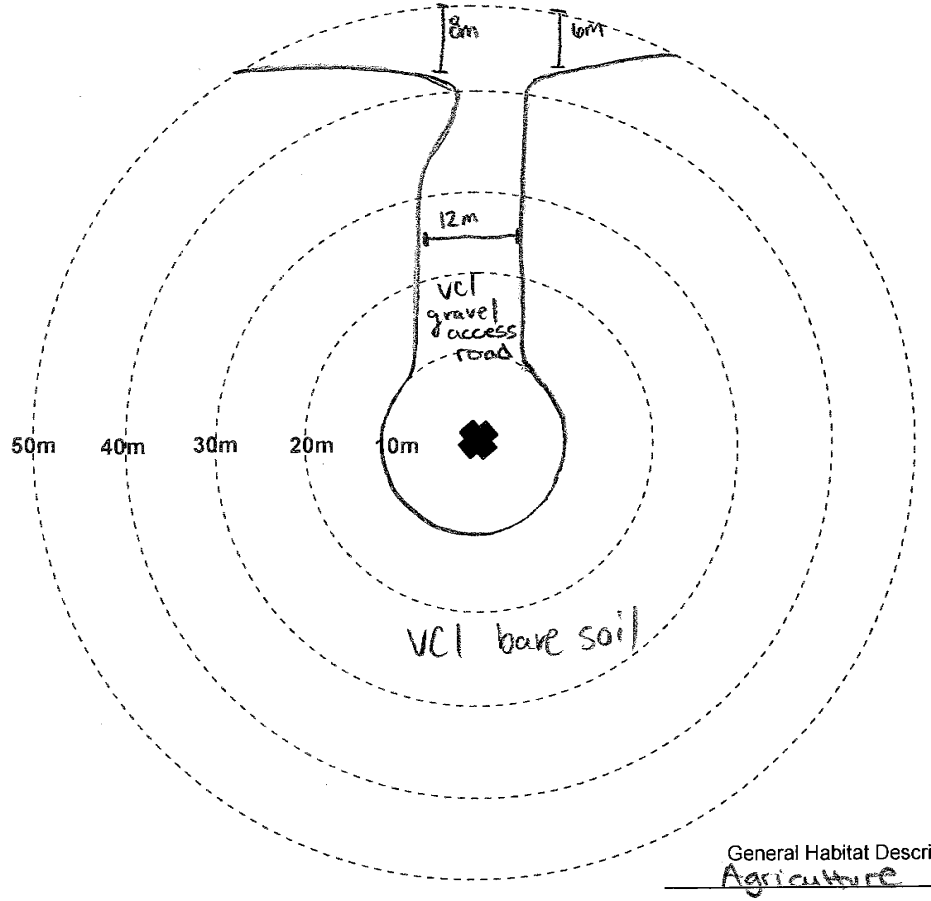
General Habitat Description: Agriculture

Photo Numbers (from turbine base)
Facing North: 4263
Facing East: 4264
Facing South: 4265
Facing West: 4266
(sketch habitat and visibility classes)

Date (DD/MM/YY): 17/08/18

Observer: Gavin F

Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture

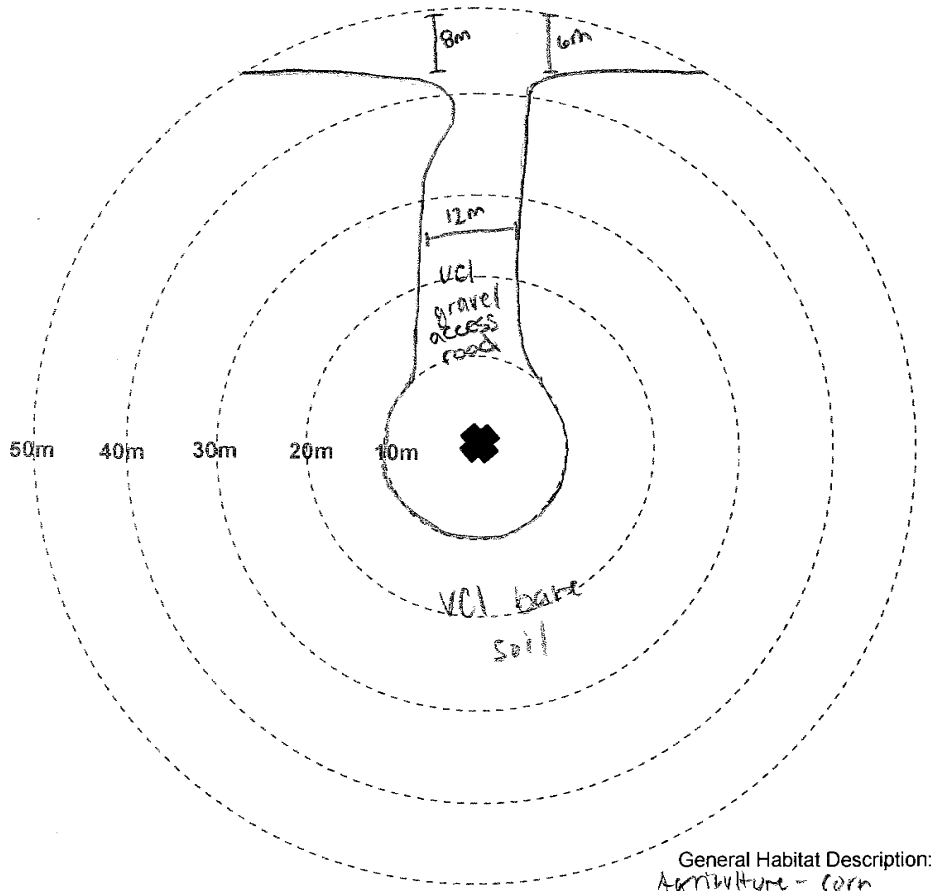
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunns Hill WF **Project #:** 18758 **Turbine #:** 09

Photo Numbers (from turbine base)
Facing North: 4558
Facing East: 4559
Facing South: 4560
Facing West: 4561
(sketch habitat and visibility classes)

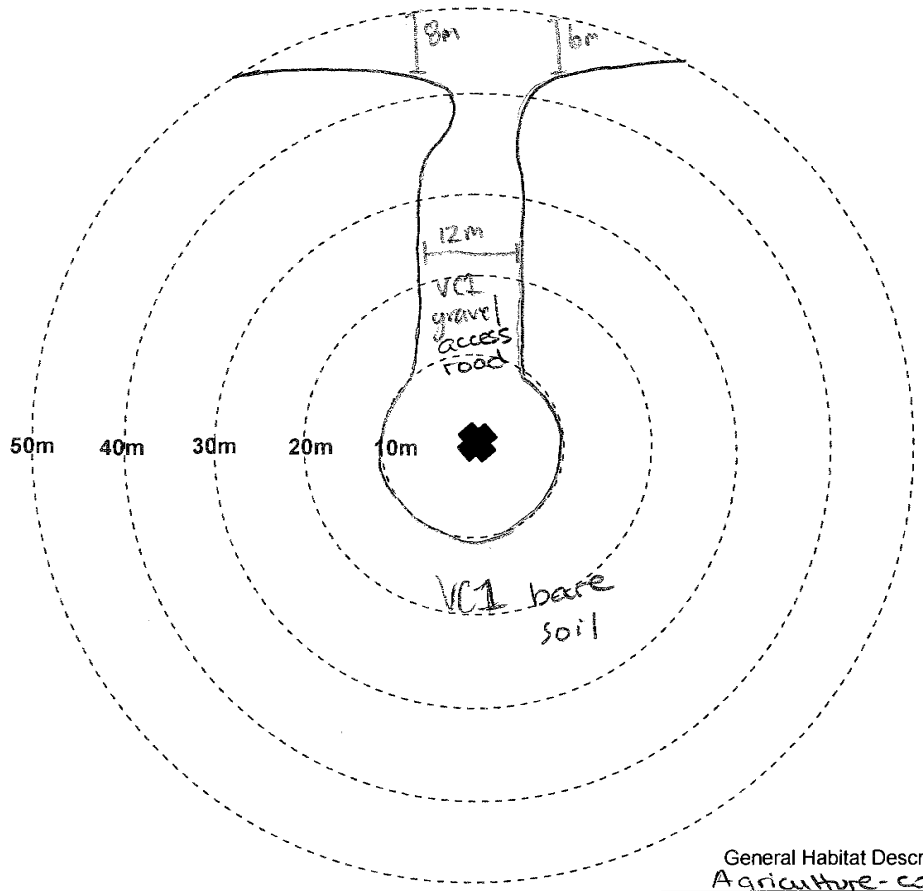
Date (DD/MM/YY): 25/09/18
Observer: Gavin F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - corn

Photo Numbers (from turbine base)
Facing North: 4682
Facing East: 4683
Facing South: 4684
Facing West: 4685
(sketch habitat and visibility classes)

Date (DD/MM/YY): 23/10/18
Observer: Gavin F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - corn

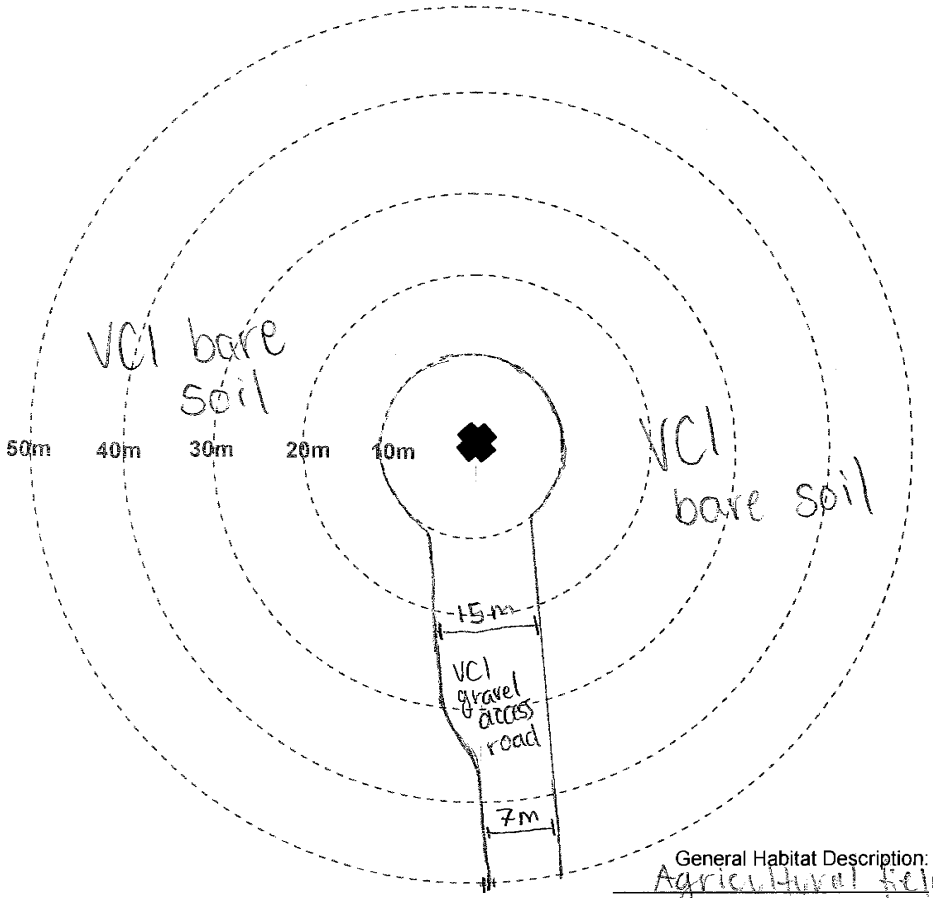
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunn's Hill WF **Project #:** 18758 **Turbine #:** 10 **Degree of Slope** 0 **degrees** **Slope Orientation** N/A *(e.g. SSW)*

Photo Numbers (from turbine base)
Facing North: 3687
Facing East: 3683
Facing South: 3684
Facing West: 3685
(sketch habitat and visibility classes)

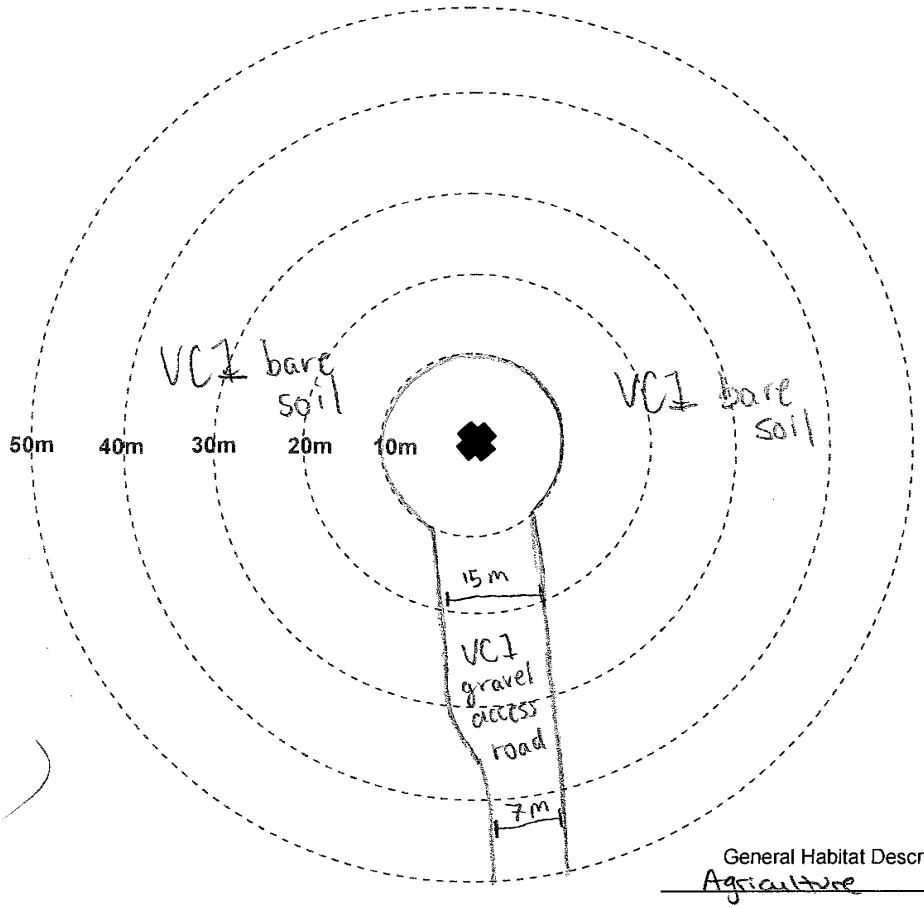
Date (DD/MM/YY): 29/05/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agricultural field

Photo Numbers (from turbine base)
Facing North: 3842
Facing East: 3843
Facing South: 3844
Facing West: 3845
(sketch habitat and visibility classes)

Date (DD/MM/YY): 12/06/18
Observer: GAVIN F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture

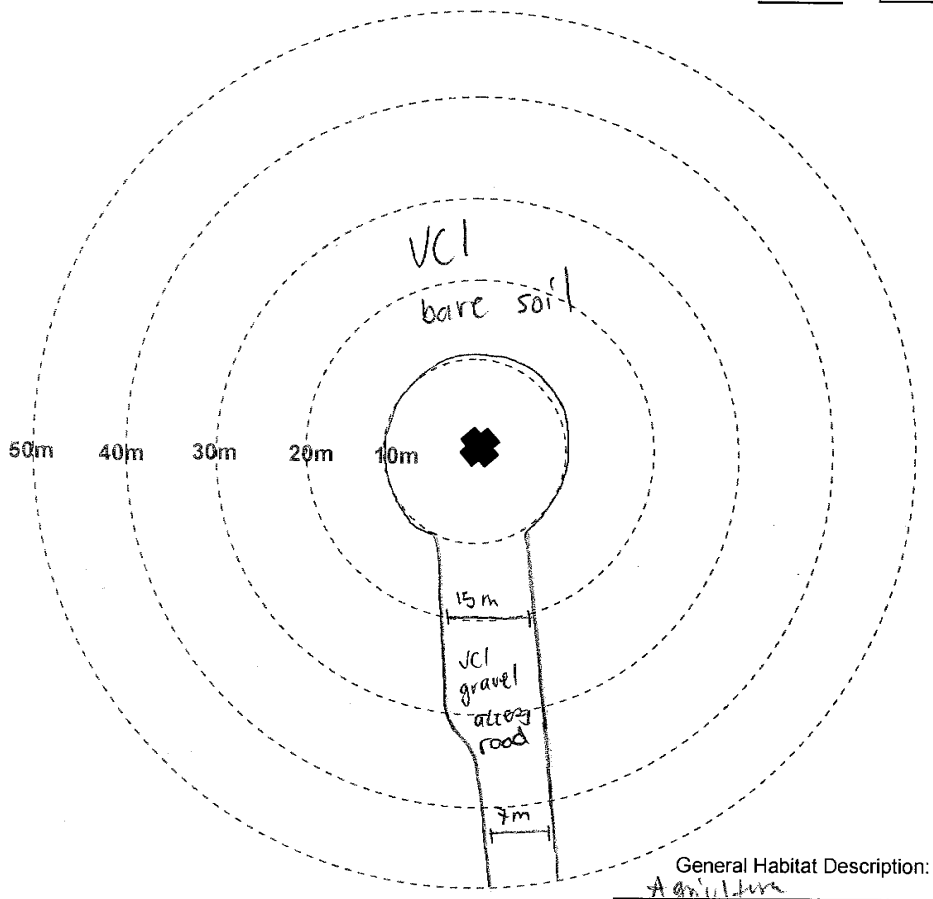
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunn's Hill WF **Project #:** 19753 **Turbine #:** 10

Photo Numbers (from turbine base)
Facing North: 4078
Facing East: 4079
Facing South: 4080
Facing West: 4081
(sketch habitat and visibility classes)

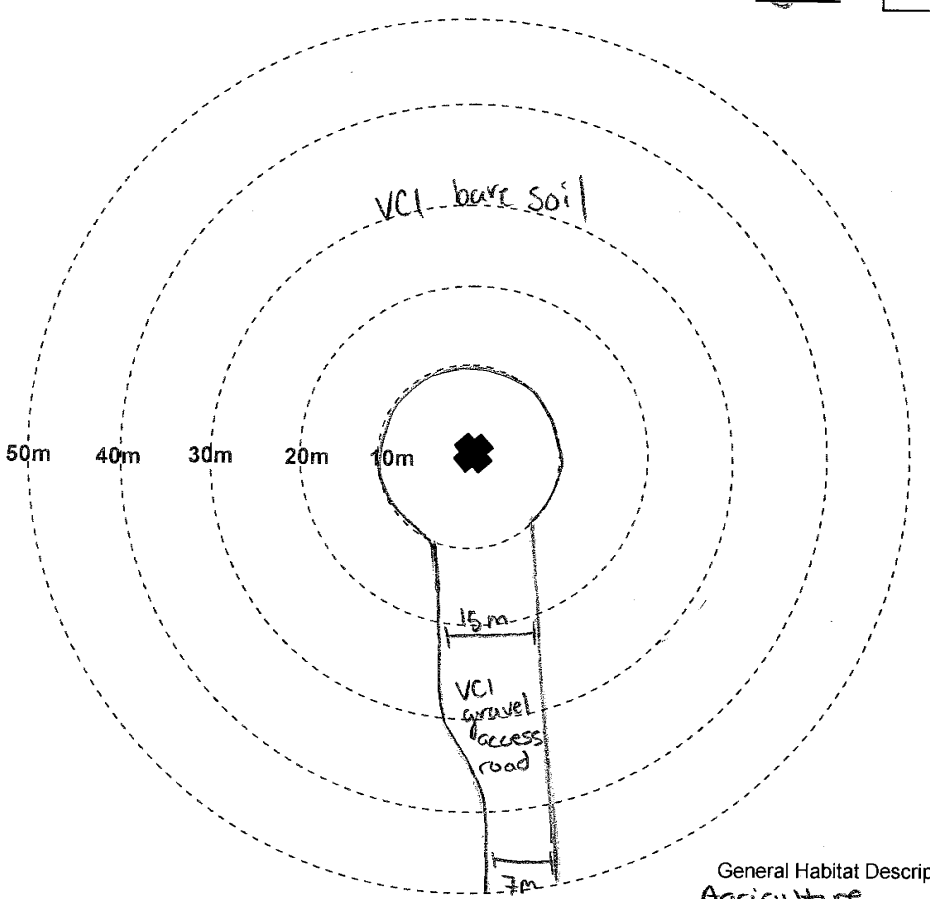
Date (DD/MM/YY): 24/07/18
Observer: Gavin F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture

Photo Numbers (from turbine base)
Facing North: 4268
Facing East: 4269
Facing South: 4270
Facing West: 4271
(sketch habitat and visibility classes)

Date (DD/MM/YY): 17/08/18
Observer: Gavin F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture

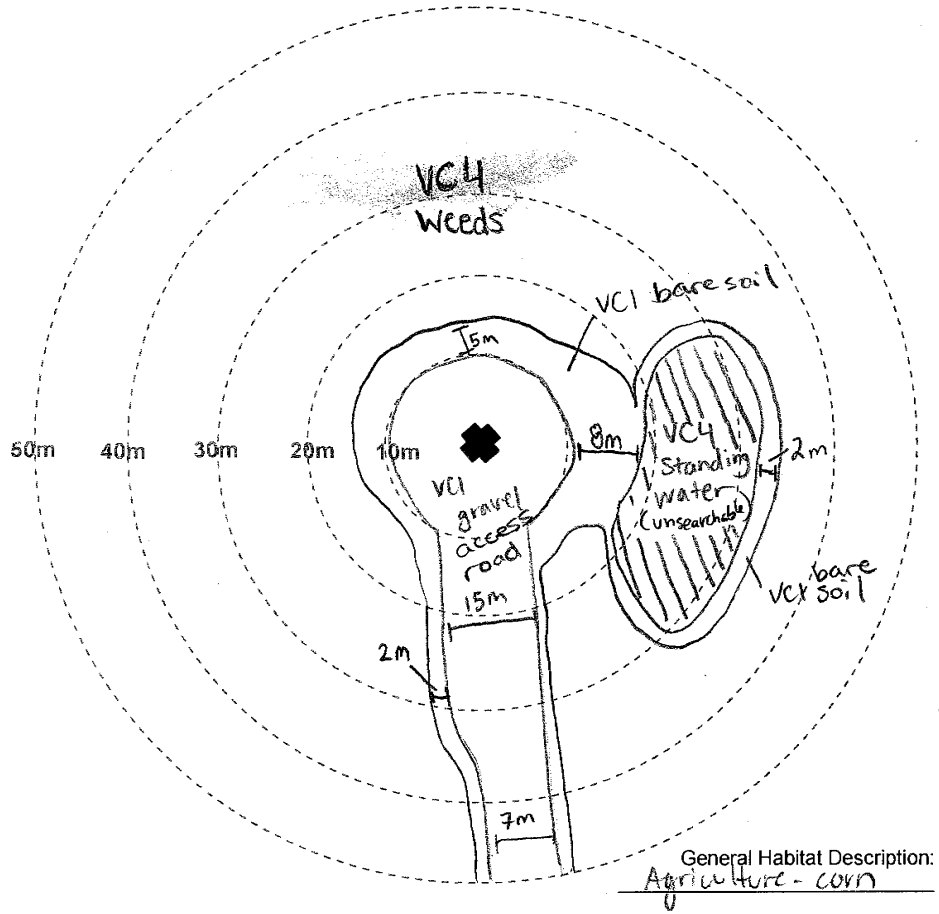
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

Visibility Class Map

Project Name: Gunn's Hill WF **Project #:** 18758 **Turbine #:** 10

Photo Numbers (from turbine base)
Facing North: 4562
Facing East: 4563
Facing South: 4564
Facing West: 4565
(sketch habitat and visibility classes)

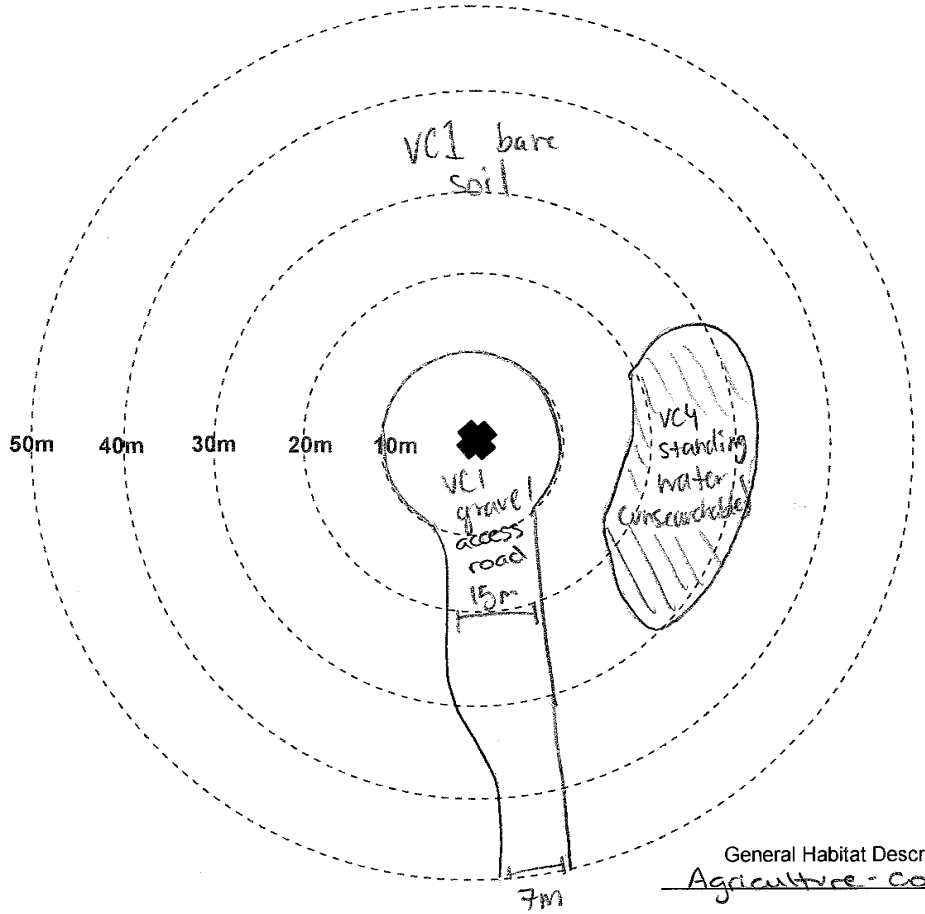
Date (DD/MM/YY): 25/09/18
Observer: Gavin F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - corn

Photo Numbers (from turbine base)
Facing North: 4686
Facing East: 4687
Facing South: 4688
Facing West: 4689
(sketch habitat and visibility classes)

Date (DD/MM/YY): 23/10/18
Observer: Gavin F
Monthly/Seasonal Linear Transect Width: 5 m



General Habitat Description: Agriculture - corn

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