



***Grand Bend Wind Farm***  
**2022 Post-construction Mortality**  
**Monitoring Report**

Prepared for:  
Grand Bend Wind LP  
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Aquatic, Terrestrial and Wetland Biologists

**Grand Bend Wind Farm  
2022 Post-construction Mortality Monitoring Report**

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## Executive Summary

Natural Resource Solutions Inc. was retained to conduct the sixth year of post-construction monitoring at the operational Grand Bend Wind Farm, located within the Municipalities of Bluewater and South Huron in Huron County, Ontario. This wind energy project has a nameplate capacity of 100MW and consists of 40 operational 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 sixth year of post-construction monitoring for bat mortality conducted at the Grand Bend Wind Farm in 2022.

This sixth year of monitoring for bat mortality was conducted as a result of exceeding the provincial threshold of 10 bats/turbine/year during the first year of monitoring (2017). As the bat mortality threshold was exceeded after operational mitigation was implemented in years 2018-2019, a bat mortality contingency plan was prepared, bat deterrents were installed, and the first year of effectiveness monitoring began in 2020. As such, 2022 represents the third year of effectiveness monitoring after implementation of the bat mortality contingency plan. Bird and raptor mortality data are not considered or presented within this report, as regulatory commitments, including associated monitoring, have already been completed and presented in previous report submissions.

During twice-weekly searches from May 1 to October 31, 2022, 44 bat mortalities were documented within the search areas around the subset of 12 turbines. Bat mortalities of both long-distance migratory and resident species were documented, including Hoary Bat (*Lasiurus cinereus*), Silver-haired Bat (*Lasionycteris noctivagans*), Eastern Red Bat (*Lasiurus borealis*), Big Brown Bat (*Eptesicus fuscus*), and Little Brown Myotis (*Myotis lucifugus*). The first three species above are considered long-distance migratory species which over-winter outside of Ontario, and represent approximately 86% of the total bat mortality observations that could be identified to the species level at the Grand Bend Wind Farm in 2022. Using appropriate correction factors, an estimated bat mortality rate of 6.74 bats/turbine/year (2.70 bats/MW/year) was determined for the Grand Bend 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 sixth year of post-construction monitoring at the operational Grand Bend Wind Farm (Grand Bend WF), located within the Municipalities of Bluewater and South Huron in Huron County, Ontario. The Grand Bend WF consists of 40 wind energy generating turbines with a total nameplate capacity of 100MW. The locations of turbines and access roads are provided on Map 1.

Post-construction mortality monitoring at the Grand Bend WF in 2022 consisted of bat mortality monitoring and the associated searcher efficiency trials, scavenger removal trials, and turbine visibility class mapping that are required in order to calculate estimated mortality rates. These surveys were conducted in accordance with provincial guidelines and approval conditions of the Grand Bend WF to assess the potential impacts of this wind energy generating facility on local and migratory bats.

The purpose of this report is to provide the detailed methods and results from the sixth year of post-construction bat mortality monitoring conducted at the Grand Bend WF and to provide a general comparison of the results to the first five years of monitoring (R.J. Burnside & Associates 2018, R.J. Burnside & Associates 2019, R.J. Burnside & Associates 2020, NRSI 2021, NRSI 2022). This sixth year of monitoring for bat mortality was conducted as a result of exceeding the provincial threshold of 10 bats/turbine/year during the first year of monitoring (2017). As the bat mortality threshold was exceeded after operational mitigation was implemented in years 2018-2019, the *Grand Bend Wind Farm: Bat Mortality Contingency Plan Rev. 1* (NRSI 2020) was prepared and bat deterrents were installed at the Grand Bend WF prior to the first year of effectiveness monitoring in 2020. As such, 2022 represents the third year of effectiveness monitoring after implementation of the bat mortality contingency plan.

Bird and raptor mortality data are not considered or presented within this report, as regulatory commitments, including associated monitoring, have already been completed and presented in previous report submissions.

For the purposes of this report, NRSI will frequently use the terms 'mortality' and 'carcass'. The term 'mortality' will refer to dead bats that were found in the vicinity of

turbines at the Grand Bend 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.

Any mortality that was incidentally observed beyond the formal search parameters of the monitoring program was still documented, photographed, and collected, but has not been included in formal calculations of estimated mortality rates and is not discussed further in this report.

## **2.0 Mortality Monitoring Methodology**

### **2.1 Mortality Monitoring**

All monitoring undertaken at the Grand Bend WF was conducted in accordance with Ministry of Natural Resources and Forestry (MNRF) guidelines (OMNR 2011) and any other associated project approval conditions. The summarized methods are provided in the following sections.

#### **2.1.1 Sample Locations**

Since the Grand Bend WF is a facility consisting of more than 10 turbines, a subset of at least 30% of turbines is required to be monitored (OMNR 2011, MOE 2014 [L4]). In accordance with these requirements, NRSI biologists conducted mortality monitoring at a subset of 12 turbines (30%) in 2022, which was consistent with the subset monitored in previous years (2017-2021) and is shown on Map 1.

#### **2.1.2 Monitoring Period and Search Frequency**

NRSI biologists conducted twice-weekly (three- and four-day intervals) mortality monitoring at the subset of 12 turbines during the monitoring period of May 1 to October 31, 2022, which is consistent with the monitoring period for bat mortalities, as identified in the MNRF guidelines (OMNR 2011).

As a result of inclement weather and other safety concerns, some turbines could not be searched on their regularly scheduled dates or could not be searched for the full survey duration (i.e., 30 minutes). These relatively minor adjustments to the monitoring protocol are not expected to impact the results or conclusions presented in this report. The dates when turbines were not able to be searched on their regularly-scheduled search date or not searched for the full survey duration are listed in Table 1.



**Table 1. Summary of Regular Search Days When Turbines Could Not be Searched (2022)**

Regular Search Date (2022)	Date Turbine Next Searched (2022) <sup>1</sup>	Turbine(s)	Rationale
May 3	May 6	T38, T33	Agricultural Activities (Pesticide Spraying)
May 17	May 20	T27	
May 24	May 27	T27	
June 3	June 7	T42 <sup>2</sup>	
June 14	June 17	T38	
June 30	July 4	T07 <sup>2</sup>	
July 1	July 5	T31	Inclement Weather (Thunderstorm)
	July 8	T27	
July 5	July 8	T27	Chemical Research Study in Progress by BASF Canada
August 4	August 8	T17, T20	Inclement Weather (Thunderstorm)
August 5	August 8	T17 <sup>2</sup>	Agricultural Activities (Pesticide Spraying)
		T20 <sup>2</sup>	Inclement Weather (Thunderstorm)
August 12	August 16	T33 <sup>2</sup>	Agricultural Activities (Pesticide Spraying)
August 16	August 18	T27 <sup>2</sup>	Inclement Weather (Thunderstorm)
September 29	September 30	T18	Turbine Maintenance
October 14	October 18	T33 <sup>2</sup>	Agricultural Activities (Pesticide Spraying)

<sup>1</sup> Due to a variety of factors which may include the duration of agricultural activities, turbine maintenance, weather conditions, the location of the project, and/or staff commitments, certain turbines could not be searched again until the next regularly scheduled search day.

<sup>2</sup> Turbine not searched for the full survey duration (i.e., 30 minutes) on the regular search date.

### 2.1.3 Sample Area and Survey Duration

NRSI biologists conducted mortality searches within a 50m radius of each turbine base. Mortality searches were conducted using linear transects, spaced approximately 3m apart. In order to maintain a consistent search effort, mortality searches followed a consistent search time of 30 minutes per turbine throughout each month of monitoring. As teams consisting of two searchers conducted each of the surveys from May 1 to October 31, this search effort is equivalent to 60 minutes per turbine of total person-effort during each search event in the monitoring period. This search effort is considerably greater than the suggested baseline effort of 20 minutes noted in the MNRF guidelines (OMNR 2011), and was implemented proactively in an effort to improve the accuracy of the monitoring results.

#### 2.1.4 Data Collection

During each visit to conduct mortality searches, all appropriate information was documented, including weather conditions, date, time, and observer. The mortality monitoring data collection sheet is 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 of the individual (if identifiable), condition, estimated time since death, any apparent injuries, distance and direction from turbine base, substrate type and visibility class, and a unique mortality identification number for future reference. 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 monitoring season is September and October. A minimum of 10 carcasses were placed during each monitoring season at the subset of 12 turbines. No more than five carcasses were placed at one time and no more than one carcass was placed at any single turbine during each trial. These measures were taken to avoid potential 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, distance and direction from turbine base, and visibility class were recorded on a data sheet during the placement of each specimen. The scavenger removal data sheet is 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 the bird and bat species used during scavenger removal trials is 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 (i.e., twice per week) to note any scavenging or signs of scavenger presence. Following 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 the search team that conducted mortality searches at the Grand Bend WF. Searcher efficiency trials were conducted on the one search team (consisting of two searchers) at a minimum of once during each season (spring, summer, and fall). In order to account for seasonal changes in groundcover, weather, or other potential variations in search conditions, NRSI conducted monthly searcher efficiency trials from May to October. During each trial, the search team was tested without their knowledge through the placement of a minimum of 10 test carcasses per visibility class searched (classes 1 and 2) at the subset of 12 turbines. During all monthly trials, no more than three carcasses were placed on any single search event, as per the *Grand Bend Wind Farm: Natural Heritage Environmental Effects Monitoring Plan* (EEMP; Neegan Burnside Ltd. 2013).

Carcasses were placed randomly within each visibility class searched, and within the 50m search radii at the subset of 12 turbines at the Grand Bend WF. Distance and direction from turbine base, visibility class, substrate type, and UTM coordinates were recorded for each test carcass placed. Each specimen found was later compared to the total number of carcasses placed at each turbine, the locations of their placement, and species placed. The data sheet used for searcher efficiency trials is provided in Appendix I.

In order to meet the understood intent of the MNRF guidelines to limit searcher bias (OMNR 2011), NRSI has not physically marked trial carcasses at this project, as marking the carcasses could influence the results of the trial by alerting the search team

to the ongoing searcher efficiency trial. Instead, NRSI biologists collect detailed information on the location of trial carcasses, including UTM coordinates, distance and direction from the turbine, and mapping the location of each carcass. All collected carcasses are compared to this detailed location and species information to distinguish between trial carcasses and turbine-related mortalities. These steps have been taken to ensure that the location of the carcasses, along with species information, is well documented for future reference should there be any uncertainty about whether an observed carcass is a turbine-related mortality 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 moderately-sized carcasses. Bat carcasses used during searcher efficiency trials included the three long-distance migratory species known to occur in 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 the bird and bat species used during searcher efficiency trials is provided in Appendix III.

#### 2.4 Proportion of Area Searched

Following MNRF guidelines, visibility class maps were completed by search teams at a minimum frequency of once per season (OMNR 2011). Due to the potential for changing conditions between monitoring months, NRSI completed visibility class maps once per month from May to October to provide additional information on the conditions of the search plots to support whether more frequent searcher efficiency trials were warranted, and ultimately to increase the accuracy of the estimated mortality rate.

Visibility class mapping was completed for the 50m search radius at each of the 12 subset turbines. This mapping categorized portions of the search area according to visibility classes recommended by the MNRF (OMNR 2011). These include visibility classes 1 through 4, in addition to any areas which may be deemed “unsearchable”, such as aquatic features, areas deemed safety hazards, or other areas where searching was not possible. Mapping of these visibility classes within the 50m search radius of

each turbine was conducted and calculated as per a repeatable methodology using a combination of the visibility class field maps, review of aerial photographs, and Geographic Information System (GIS) software. The data sheet used to record visibility class mapping includes the definitions of the visibility classes used and is provided in Appendix I.

In an effort to increase the accuracy of searcher efficiency rates and minimize the influence of the proportion of area searched on the bat mortality estimate, the search radii at the subset of 12 turbines were maintained at visibility classes 1 or 2 by occasional plowing or mowing during the monitoring year (May through October), as needed. Small areas of other visibility classes were occasionally present, particularly near the outer limit of the 50m radii. When small and/or 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 2022 monitoring period. Some larger areas were mapped as visibility classes that were not searched as part of this monitoring program (i.e., visibility class 3 or 4) during a particular month. In these cases, the appropriate proportion of area searched was calculated and used for the final mortality estimate. Visibility class maps for each turbine in each month are provided in Appendix IV.

Maintenance of the 50m search radii was only completed when necessary to maintain appropriate mortality visibility and followed a strict schedule 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 rate at the Grand Bend WF.

### 3.0 Scavenger Removal Trial Results

Scavenging activity at the Grand Bend WF was generally moderate during the spring and fall seasons, and lowest during the summer season.

Table 2 shows the results of the seasonal scavenger removal trials conducted at the Grand Bend 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 are provided in Appendix II.

**Table 2. Number of Carcasses Remaining During Scavenger Removal Trials at the Grand Bend Wind Farm (2022)**

Number of Carcasses Remaining					
Spring Trial (May/June)					
Turbine	Visit 0	Visit 1	Visit 2	Visit 3	Visit 4
T02	1	1	1	1	1
T16	1	0	0	0	0
T20	1	0	0	0	0
T17	1	0	0	0	0
T18	1	0	0	0	0
T27	1	1	0	0	0
T38	1	0	0	0	0
T42	1	0	0	0	0
T48	1	0	0	0	0
T31	1	1	1	1	1
<b>Total</b>	<b>10</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>
Summer Trial (July/August)					
Turbine	Visit 0	Visit 1	Visit 2	Visit 3	Visit 4
T02	1	1	0	0	0
T16	1	1	0	0	0
T17	1	1	0	0	0
T18	1	1	0	0	0
T20	1	1	1	1	1
T31	1	1	1	1	1
T33	1	1	0	0	0
T38	1	1	1	1	1
T42	1	1	0	0	0
T48	1	0	0	0	0
<b>Total</b>	<b>10</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>3</b>
Fall Trial (September/October)					
Turbine	Visit 0	Visit 1	Visit 2	Visit 3	Visit 4

Number of Carcasses Remaining					
T07	1	0	0	0	0
T16	1	0	0	0	0
T17	1	1	0	0	0
T18	1	1	0	0	0
T20	1	1	1	1	1
T48	1	0	0	0	0
T42	1	0	0	0	0
T38	1	1	1	1	1
T33	1	0	0	0	0
T31	1	1	0	0	0
<b>Total</b>	<b>10</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>2</b>

To calculate the scavenger removal rate for each of the specific monitoring periods, NRSI has used the following equation recommended by the MNRF:

$$Sc = \frac{n_{\text{visit1}} + n_{\text{visit2}} + n_{\text{visit3}} + n_{\text{visit4}}}{n_{\text{visit0}} + n_{\text{visit1}} + n_{\text{visit2}} + n_{\text{visit3}}}$$

Sc: proportion of carcasses not removed by scavengers

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

$n_{\text{visit1}} - n_{\text{visit4}}$ : number of carcasses remaining on visits 1 through 4

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

$$\begin{aligned} SC_{\text{Spring}} &= (3 + 2 + 2 + 2) / (10 + 3 + 2 + 2) \\ &= 9 / 17 \\ &= \mathbf{0.53} \end{aligned}$$

$$\begin{aligned} SC_{\text{Summer}} &= (9 + 3 + 3 + 3) / (10 + 9 + 3 + 3) \\ &= 18 / 25 \\ &= \mathbf{0.72} \end{aligned}$$

$$\begin{aligned} SC_{\text{Fall}} &= (5 + 2 + 2 + 2) / (10 + 5 + 2 + 2) \\ &= 11 / 19 \\ &= \mathbf{0.58} \end{aligned}$$

The above scavenger removal rates represent the proportion of carcasses still remaining from one visit to the next. These values generally represent a low level of scavenging activity in the summer and a moderate level of scavenging activity in the spring and fall. These values are used to calculate the estimated bat mortality rate in Section 6.0.

#### 4.0 Searcher Efficiency Trial Results

Searcher efficiency rates at the Grand Bend WF were generally high throughout the 2022 monitoring period, with the highest rates occurring in the summer and fall seasons. Results of the monthly searcher efficiency trials are summarized in Table 3 below. Details on the search team, species, distance and direction from turbine, UTM coordinates, visibility class, habitat/substrate, and whether the carcass was found or scavenged are provided in Appendix III.

**Table 3. Results of Searcher Efficiency Trials at the Grand Bend Wind Farm (2022)**

Searcher(s)	Carcasses Found	Carcasses Placed	Carcasses Scavenged	Searcher Efficiency (Se)	Proportion of Turbines Searched
<b>May 2022</b>					
Search Team A	15	22	3	0.79	1.00
<b>June 2022</b>					
Search Team A	13	22	3	0.68	1.00
<b>July 2022</b>					
Search Team A	16	20	3	0.94	1.00
<b>August 2022</b>					
Search Team A	18	20	0	0.90	1.00
<b>September 2022</b>					
Search Team A	19	26	6	0.95	1.00
<b>October 2022</b>					
Search Team A	17	26	8	0.94	1.00

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

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

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

$$SeO_{\text{May}} = 0.79 (1.00) = \mathbf{0.79}$$

$$SeO_{\text{June}} = 0.68 (1.00) = \mathbf{0.68}$$

$$SeO_{\text{July}} = 0.94 (1.00) = \mathbf{0.94}$$

$$SeO_{\text{August}} = 0.90 (1.00) = \mathbf{0.90}$$

$$SeO_{\text{September}} = 0.95 (1.00) = \mathbf{0.95}$$



$$SeO_{\text{October}} = 0.94 (1.00) = \mathbf{0.94}$$

These searcher efficiency values represent relatively high searcher efficiency rates, likely due to the additional search effort and steps taken to maintain clear search areas and 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 are used to calculate the estimated bat mortality rate in Section 6.0.

## 5.0 Proportion of Area Searched Results

Visibility class mapping was completed each month from May to October within the 50m search radius at each of the 12 subset turbines in order to reflect changes in groundcover, land use, or other seasonal factors that may influence the resulting visibility classes.

NRSI biologists searched all areas of visibility classes 1 and 2 at each subset turbine, which have been combined to represent the proportion of area searched (Ps).

In July, August, September, and October, some small areas of visibility classes 3 and 4 were present at 4 turbines for an extended period within the months. These small, and persistent, areas of visibility classes 3 and 4 were not searched, and are reflected as such in the Total Searched Area values below.

The calculations in Table 4 below show the Ps value during each month of the monitoring program for all 12 subset turbines. The Ps values are used to calculate the estimated bat mortality rate in Section 6.0. Visibility class mapping is provided in Appendix IV.

**Table 4. Proportion of Area Searched at the Grand Bend Wind Farm (2022)**

Month	Total Searched Area (m <sup>2</sup> ) <sup>1</sup>	Total Search Radius (m <sup>2</sup> )	Proportion of Area Searched (Ps)
May	94,200	94,200	1.00
June	94,200	94,200	1.00
July	92,782	94,200	0.98
August	93,110	94,200	0.99
September	93,110	94,200	0.99
October	93,580	94,200	0.99

<sup>1</sup> Total area searched includes all areas identified as visibility classes 1 and 2.

## 6.0 Bat Mortality Results

### 6.1 Bat Mortalities

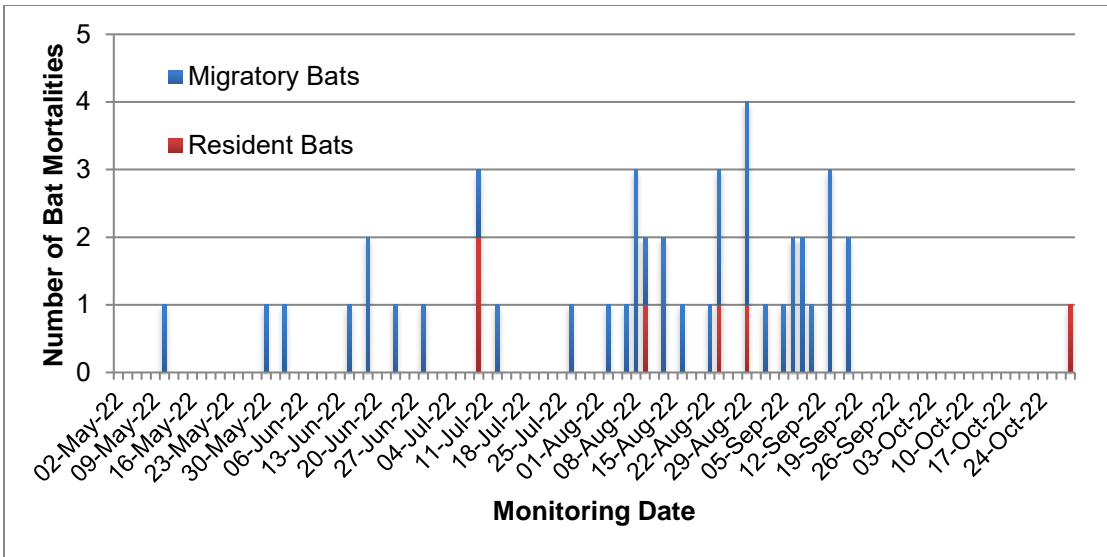
During post-construction mortality monitoring at the Grand Bend WF in 2022, NRSI biologists documented 44 bat mortalities within the 50m search radii at the subset of 12 turbines. Bat mortalities represented five different species, including three long-distance migratory species (Eastern Red Bat, Hoary Bat, and Silver-haired Bat), as well as the resident species Big Brown Bat (*Eptesicus fuscus*) and Little Brown Myotis (*Myotis lucifugus*). The most abundant species observed was Hoary Bat (n=15), followed by Silver-haired Bat (n=12), Eastern Red Bat (n=11), Big Brown Bat (n=4), and Little Brown Myotis (n=2). Observed mortalities of the three long-distance migratory bat species combined to represent approximately 86% of all bat mortalities documented at the subset.

A detailed discussion of bat mortalities observed during 2022 post-construction mortality monitoring at the Grand Bend WF is included in the following sections. A list of each bat mortality, including date and time of observation, location, and species, is provided in Appendix V.

### 6.2 Temporal Distribution of Bat Mortalities

Bat mortalities were generally observed throughout the monitoring period, but were most commonly observed during the month of August (n=18) (see Figure 1 below). The monitoring date with the highest number of documented mortalities was August 29, 2022, when four bat mortalities were documented across the monitoring subset. Bat mortalities by date are shown on Figure 1 below.

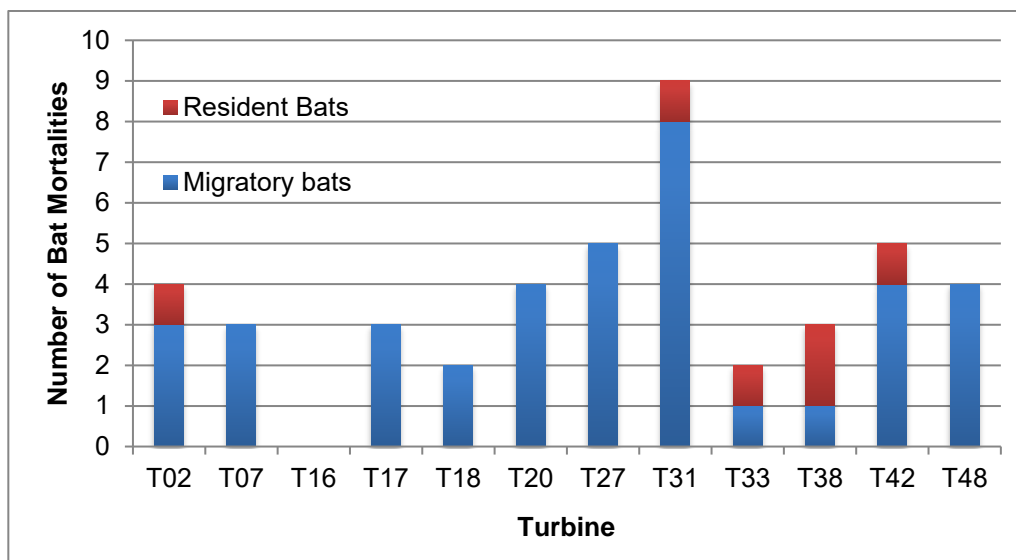
Patterns of bat mortalities appear to be consistent with the expected migratory time periods for these species, with increases in long-distance migratory bat mortalities expected during the mid- to late-summer. Overall, bat mortality was highest from early August to mid-September, corresponding to the anticipated peak periods of summer swarming and early fall migration of bats.



**Figure 1. Bat Mortalities Observed by Date at the Grand Bend Wind Farm (2022)**

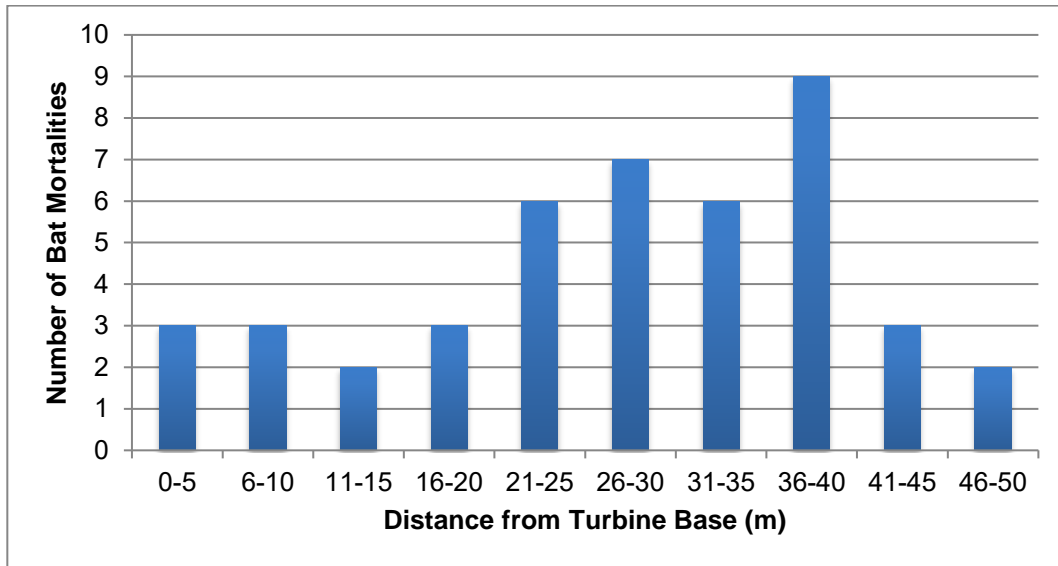
### 6.3 Spatial Distribution of Bat Mortalities

Bat mortalities were observed at 11 of the 12 subset turbines at the Grand Bend WF in 2022, ranging from no bat mortalities at Turbine T16 to nine bat mortalities at Turbine T31 (see Figure 2 below). The six turbines with the highest bat mortality (T02, T20, T27, T31, T42 and T48) are geographically diverse within the project area, and no clear geographic patterns of bat mortality are immediately apparent. Maps identifying the location of each observed mortality by turbine are provided in Appendix VI.



**Figure 2. Bat Mortalities Observed by Turbine at the Grand Bend Wind Farm (2022)**

Distance and direction of bat mortalities from each of the turbine bases were also documented for each observed mortality. Bat mortalities were generally found throughout the area searched by NRSI biologists, ranging in distance from 0m to 50m from the turbine base, with an average distance of approximately 27m from the turbine base. The overall distribution of mortalities by distance class is shown on Figure 3 below.



**Figure 3. Bat Mortalities Observed by Distance from Turbine at the Grand Bend Wind Farm (2022)**

#### 6.4 Corrected (Estimated) Bat Mortality

Based on field observations at the Grand Bend WF, NRSI biologists have compiled the searcher efficiency trials, scavenger removal trials, proportion of area searched, and direct mortality observations into an equation that will be used to estimate the total bat mortality at the Grand Bend WF in 2022. The equation recommended by the MNRF is found below:

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

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

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

$$C_{\text{May}} = 2 / (0.79 \cdot 0.53 \cdot 1.00) = 2 / 0.4187 = 4.78 \text{ bats}$$

$$= \mathbf{0.40 \text{ bats/turbine}} \text{ (0.16 bats/MW)}$$
  

$$C_{\text{June}} = 6 / (0.68 \cdot 0.53 \cdot 1.00) = 6 / 0.3604 = 16.65 \text{ bats}$$

$$= \mathbf{1.39 \text{ bats/turbine}} \text{ (0.56 bats/MW)}$$
  

$$C_{\text{July}} = 5 / (0.94 \cdot 0.72 \cdot 0.98) = 5 / 0.6633 = 7.54 \text{ bats}$$

$$= \mathbf{0.63 \text{ bats/turbine}} \text{ (0.25 bats/MW)}$$
  

$$C_{\text{August}} = 18 / (0.90 \cdot 0.72 \cdot 0.99) = 18 / 0.6415 = 28.06 \text{ bats}$$

$$= \mathbf{2.34 \text{ bats/turbine}} \text{ (0.94 bats/MW)}$$
  

$$C_{\text{September}} = 12 / (0.95 \cdot 0.58 \cdot 0.99) = 12 / 0.5455 = 22.00 \text{ bats}$$

$$= \mathbf{1.83 \text{ bats/turbine}} \text{ (0.73 bats/MW)}$$
  

$$C_{\text{October}} = 1 / (0.94 \cdot 0.58 \cdot 0.99) = 1 / 0.5397 = 1.85 \text{ bats}$$

$$= \mathbf{0.15 \text{ bats/turbine}} \text{ (0.06 bats/MW)}$$
  

$$\mathbf{\text{Total}} = \mathbf{6.74 \text{ bats/turbine}} \text{ (2.70 bats/MW)}$$

Using the appropriate variables and recommended equations provided by the MNRF, NRSI has determined the corrected (estimated) bat mortality at the Grand Bend WF in 2022 to be 6.74 bats/turbine/year (2.70 bats/MW/year). The monthly estimated mortality rates, and resulting annual estimated bat mortality rate, for the Grand Bend WF are provided in Table 5 below.

**Table 5. Corrected Bat Mortality Rates Based on Mortality Monitoring at the Grand Bend Wind Farm (2022)**

Month (2021)	Observed Bat Mortalities	Corrected Mortality (bats/turbine)	Corrected Mortality (bats/MW)
May	2	0.40	0.16
June	6	1.39	0.56
July	5	0.63	0.25
August	18	2.34	0.94
September	12	1.83	0.73
October	1	0.15	0.06
<b>TOTAL</b>	<b>44</b>	<b>6.74</b>	<b>2.70</b>

Based on the information collected during the 2022 post-construction monitoring period, the anticipated impact of this facility on bats is characterized by a corrected mortality rate

of **6.74 bats/turbine/year** (2.70 bats/MW/year), which is below the provincial threshold of 10 bats/turbine/year.

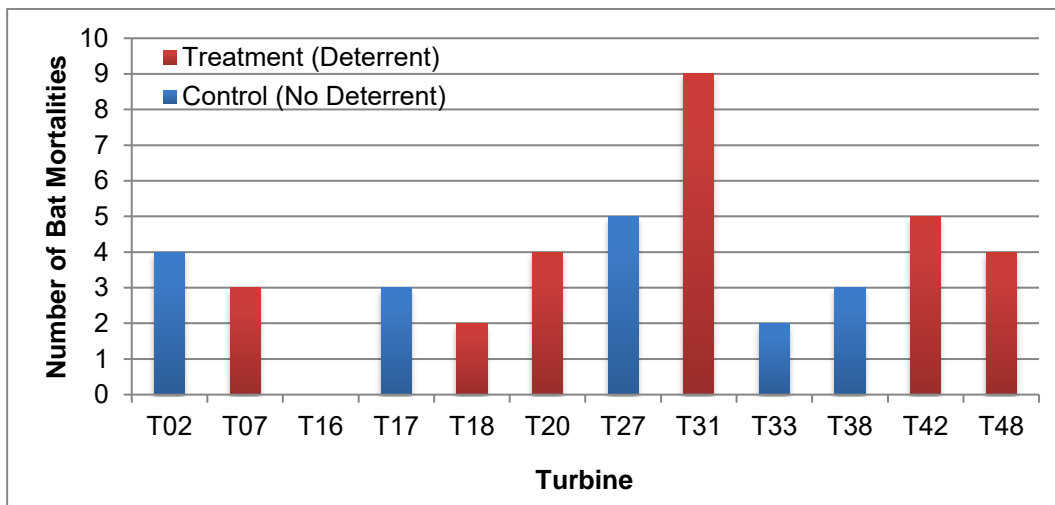
## 7.0 Assessment of Bat Contingency Measures

As outlined in the accepted *Grand Bend Wind Farm: Bat Mortality Contingency Plan Rev. 1* (Contingency Plan; NRSI 2020), acoustic bat deterrents were installed as a contingency measure on six of the 12 subset turbines (50%) prior to May 1, 2020 and were activated between sunset and sunrise throughout the bat active season (May 1 – October 31) in 2020, 2021, and 2022. The following section provides an analysis of the effectiveness of the bat deterrent units in reducing estimated bat mortality rates at the Grand Bend WF.

The acoustic bat deterrents were selectively installed in 2020 on six turbines that have previously demonstrated high bat mortality, relative to other turbines within the monitoring subset (Map 1). Although this approach will make direct comparisons between treatment and control turbines more difficult, this strategy was chosen in an effort to minimize overall bat mortality while maximizing the benefit of the acoustic deterrents at the onset of implementation.

### 7.1 Contingency Plan Monitoring Results

During the 2022 post-construction mortality monitoring period, 17 bat mortalities were documented at the six control turbines (i.e., no deterrent) and 27 bat mortalities were documented at the six treatment turbines (i.e., with deterrent) (see Figure 4 below).



**Figure 4. Bat Mortalities Observed at Treatment and Control Turbines at the Grand Bend Wind Farm (2022)**



To facilitate a comparison between treatment and control turbines, separate calculations of the corrected (estimated) bat mortality rates at the six control turbines (i.e., no deterrent), for the corrected (estimated) bat mortality rates at the six treatment turbines (i.e., with deterrent), and for all 12 subset turbines as a whole, are presented in Table 6 below.

**Table 6. Corrected Bat Mortality Rates at Treatment and Control Turbines at the Grand Bend Wind Farm (2022)**

Month (2022)	Corrected Mortality (bats/turbine)		
	Control Turbines (No Deterrent)	Treatment Turbines (with Deterrent)	All Subset Turbines Combined
May	0.40	0.40	0.40
June	1.39	1.39	1.38
July	0.25	1.01	0.63
August	2.08	2.60	2.34
September	0.92	2.75	1.83
October	0.31	0.00	0.15
<b>TOTAL</b>	<b>5.35</b>	<b>8.15</b>	<b>6.74</b>

Results of the 2022 bat mortality monitoring program indicate slightly higher bat mortality at the six treatment turbines (i.e., with deterrent), when compared with the six control turbines (i.e., no deterrent); however, this is likely due to the six treatment turbines being selected based on higher levels of bat mortality observed during the pre-treatment monitoring years from 2017-2019 (n=108, 62%), relative to the other subset turbines (n=66, 38%). When considered as a proportion of total mortalities documented across the subsample, the number of mortalities observed at the six treatment subset turbines from 2020-2022 accounted for 5% less of the mortalities observed prior to the implementation of deterrents. Therefore, results indicate that a relative reduction of the bat mortalities at the six treatment subset turbines occurred following the implementation of the acoustic deterrents, indicating they were successful in reducing impacts to bats.

In consideration of the corrected (estimated) bat mortality rates, NRSI has calculated rates for the entire 12 subset turbines, as well as the separate rates for each of the control turbines and treatment turbines. In all cases, the corrected (estimated) bat mortality rates were below the provincial threshold of 10 bats/turbine/year, indicating that the Contingency Plan (i.e., installation of bat deterrents at 50% of the subset turbines)

was effective in reducing estimated bat mortality rates at the Grand Bend WF during the 2022 monitoring year.

As this third and final year of effectiveness monitoring continues to demonstrate that the bat deterrent systems have been successful in sufficiently reducing bat mortality at the Grand Bend WF at their current implementation on 50% of the subset turbines, the Contingency Plan requires the Grand Bend WF to install deterrents on a minimum of 50% of the non-subset turbines to ensure the facility, as a whole, is operated in a similar manner to the subset turbines during this assessment of effectiveness.

In accordance with the Contingency Plan, acoustic bat deterrents will be installed on a minimum of 14 additional (i.e., non-subset) turbines. The specific timing of deterrent installation will be dependent on equipment availability and suitable weather conditions at the time of delivery. At a minimum, installations will occur in 2023, such that deterrents will be fully operational by May 1, 2024; however, it is currently expected that installation will occur by the spring of 2023, such that deterrents will be fully operational by June 1, 2023. The selection of the additional turbines will be made by an ecologist, or ecological consultant, with experience assessing impacts of wind energy on bats, and the selection will consider similar criteria to what was used in the selection of the original six turbines including, but not limited to, the number of documented mortalities, geographic location, proximity to notable natural or landscape features (e.g., shoreline, woodlands, wetlands, etc.), and proximity to previously identified higher risk turbines. Following installation, acoustic bat deterrents will be activated at all 20 turbines, including the 14 non-subset turbines and the six existing treatment turbines, between sunset and sunrise throughout the bat active season (May 1 – October 31) for the remainder of the Grand Bend WF operational lifespan.

## 8.0 Mortality Thresholds and Notifications

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

### 8.1 Annual Bat Mortality

The annual bat mortality threshold for the Grand Bend WF is 10 bats/turbine/year. Based on an estimated rate of 6.74 bats/turbine/year, the annual mortality estimate for the Grand Bend WF in 2022 remains below this provincial threshold. Since the results are below the established threshold, no notification is required.

### 8.2 Species at Risk Mortality Event

Any provincially listed Threatened or Endangered Species at Risk (MECP 2022) mortality documented during post-construction mortality monitoring at the Grand Bend WF requires formal notification to the Ministry of the Environment, Conservation and Parks (MECP) and MNRF within 24 hours (or next business day) of a confirmed species identification (Neegan Burnside Ltd. 2013).

Where applicable, and in accordance with the *Grand Bend Wind Farm: Natural Heritage Environmental Effects Monitoring Plan* (Neegan Burnside Ltd. 2013), notifications were sent to the MECP and MNRF within 24 hours (or next business day), following confirmed identifications of any Species at Risk mortalities at the Grand Bend WF.

## 9.0 Comparative Annual Results

Mortality monitoring conducted by NRSI in 2022 represents the sixth year of post-construction mortality monitoring at the Grand Bend WF, and the third year of effectiveness monitoring after the implementation of the Contingency Plan (NRSI 2020). The following section provides a summarized comparison of the post-construction mortality monitoring results from 2017 to 2022, specific to bats.

Table 7 below provides an abbreviated summary of the total bat mortalities and corrected (estimated) mortality rates for each of the six years of mortality monitoring conducted at the Grand Bend WF. Further details of the 2022 bat mortality results are provided in Section 6.0 of this report.

**Table 7. Comparative Results of Bat Mortality Monitoring Seasons (2017-2022)**

Year	Mitigation Strategy	Total Mortalities	Corrected Mortality Rates	
			Bats/Turbine/Year	Bats/MW/Year
<b>May 1 to October 31 Monitoring Period</b>				
2017 <sup>1</sup>	• Normal operations	91	27.85	11.23
2018 <sup>2</sup>	• 5.5 m/s cut-in speed <sup>4</sup>	36	10.19	4.11
2019 <sup>3</sup>		47	14.86	5.99
2020	• 5.5 m/s cut-in speed <sup>4</sup> • Acoustic deterrents	41	4.95	1.99
2021		42	5.88	2.39
2022		44	6.74	2.70

<sup>1</sup> R.J. Burnside & Associates 2018

<sup>2</sup> R.J. Burnside & Associates 2019

<sup>3</sup> R.J. Burnside & Associates 2020

<sup>4</sup> Refers to the MNRF recommended mitigation measure of increasing the turbine cut-in speed to 5.5 m/s between sunset and sunrise from July 15 to September 30

Although a general comparison between the six years of post-construction monitoring data has been made above, the differences in searcher efficiency rates, scavenger removal rates, and proportion of area searched over the six monitoring years do not necessarily allow for a direct comparative analysis of observed mortalities between each year. Local 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.

In addition, the approach to turbine operation has also changed throughout the 2017-2022 monitoring period. Beginning in the 2018 monitoring year, operational mitigation below wind speeds of 5.5m/s was applied at all turbines at the Grand Bend WF from sunset to sunrise, from July 15 to September 30, in accordance with the MNRF guidelines (OMNR 2011). Prior to the 2020 monitoring year, additional measures were taken and acoustic bat deterrents were installed at six of the 12 subset turbines, which were used as an additive measure to the previously implemented operational mitigation. These considerations further add to the challenges of making direct comparisons between monitoring years.

Despite these comparative challenges, general comparisons between the monitoring years have been made. Overall, the uncorrected number of bat mortalities documented in 2018, 2019, 2020, 2021, and 2022 were similar, and were notably lower than the number of bat mortalities documented in the first year of monitoring (2017), which is likely a result of the implementation of operational mitigation after the 2017 monitoring year. The corrected bat mortality rate was similar in each of 2018 and 2019, while the 2020, 2021, and 2022 monitoring years have resulted in lower corrected bat mortality rates observed compared to the previous monitoring years, which is likely attributed to the implementation of the Contingency Plan, and the installation of acoustic deterrents, prior to the 2020 monitoring season.

## 10.0 Summary and Conclusions

NRSI was retained to conduct the sixth year of post-construction monitoring at the operational Grand Bend WF. The Grand Bend WF consists of 40 wind energy generating turbines with a total nameplate capacity of 100MW.

As a result of exceeding the provincial threshold of 10 bats/turbine/year during the first year of monitoring in 2017, and exceeding the provincial threshold after operational mitigation was implemented in both 2018 and 2019, monitoring in 2022 represents the third and final year of effectiveness monitoring after implementation of the bat mortality contingency plan (NRSI 2020).

Post-construction monitoring at the Grand Bend WF in 2022 included bat mortality monitoring and the associated searcher efficiency trials, scavenger removal trials, and visibility class mapping that are used in the calculation of estimated mortality rates. These surveys were conducted to assess the potential impacts of this wind energy generating facility on local and migratory bats.

During the monitoring program, 44 bat mortalities were documented at the Grand Bend WF. Long-distance migratory bat species were the most commonly observed mortalities, representing approximately 86% of the documented mortalities that could be identified to the species level. Based on the number of observed bat mortalities, searcher efficiency rates, scavenger removal rates, proportions of area searched, and equations recommended by the MNRF, a total corrected (estimated) bat mortality rate of **6.74 bats/turbine/year** (2.70 bats/MW/year) has been determined for the Grand Bend WF. This estimated bat mortality rate is below the provincial threshold of 10 bats/turbine/year established by the MNRF guidelines.

As this third and final year of effectiveness monitoring continues to demonstrate that the bat deterrent systems have been successful in sufficiently reducing bat mortality at the Grand Bend WF at their current implementation on 50% of the subset turbines, the Contingency Plan requires the Grand Bend WF to install deterrents on a minimum of 50% of the non-subset turbines to ensure the facility, as a whole, is operated in a similar manner to the subset turbines during this assessment of effectiveness.

In accordance with the Contingency Plan, acoustic bat deterrents will be installed on a minimum of 14 non-subset turbines. The specific timing of deterrent installation will be dependent on equipment availability and suitable weather conditions at the time of delivery. At a minimum, installations will occur in 2023, such that deterrents will be fully operational by May 1, 2024; however, it is currently expected that installation will occur by the spring of 2023, such that deterrents will be fully operational by June 1, 2023. At a minimum, acoustic bat deterrents will be activated at the 14 non-subset turbines, in addition to the six treatment subset turbines monitored during effectiveness monitoring, between sunset and sunrise throughout the bat active season (May 1 – October 31) for the remainder of the Grand Bend WF operational lifespan.

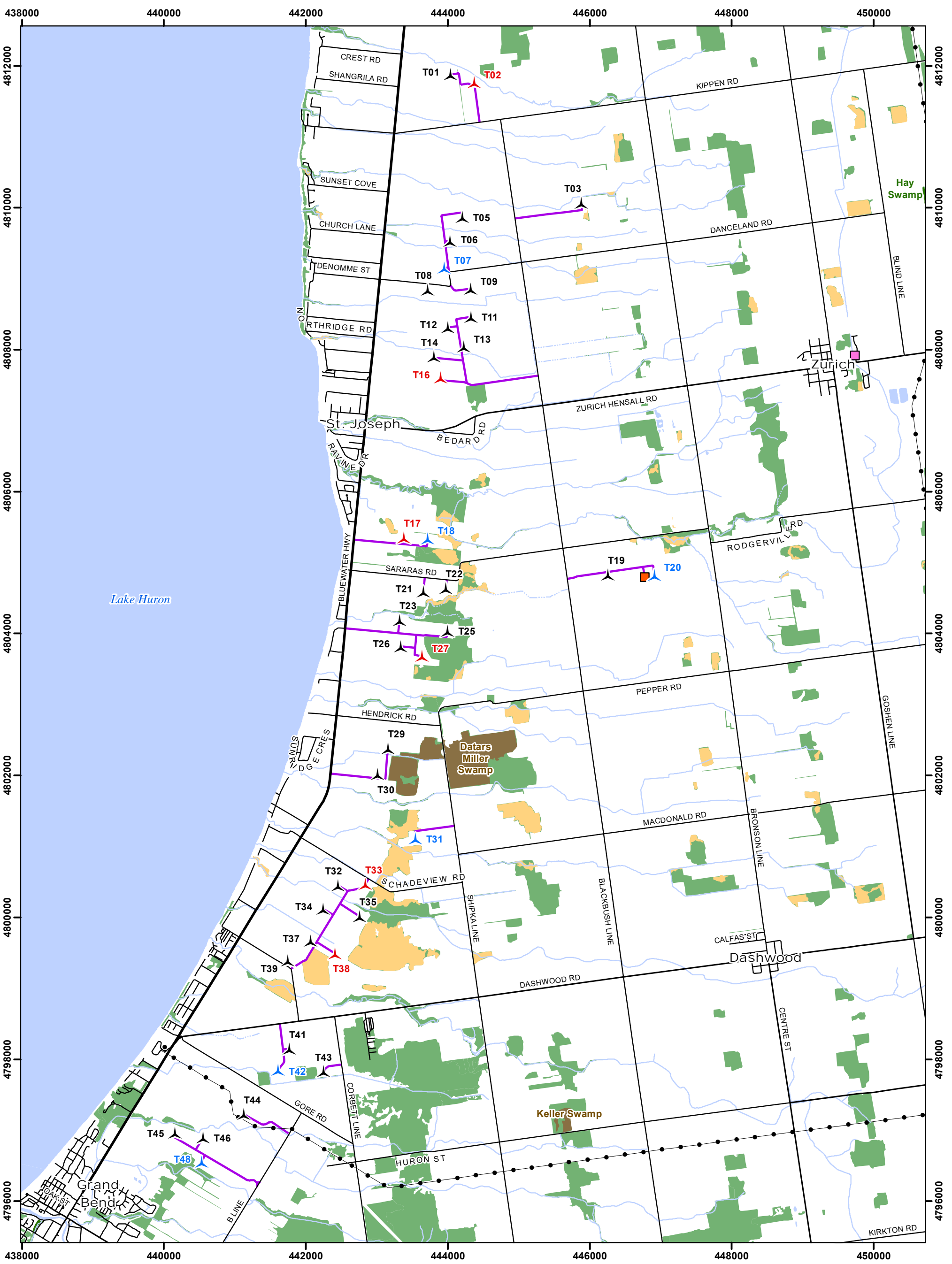
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- R.J. Burnside & Associates Limited (R.J. Burnside & Associates). 2018. Grand Bend Wind Farm Post-Construction Monitoring Report – Year 1. February 2018 (Revised May 2018).



**Maps**

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**Legend**

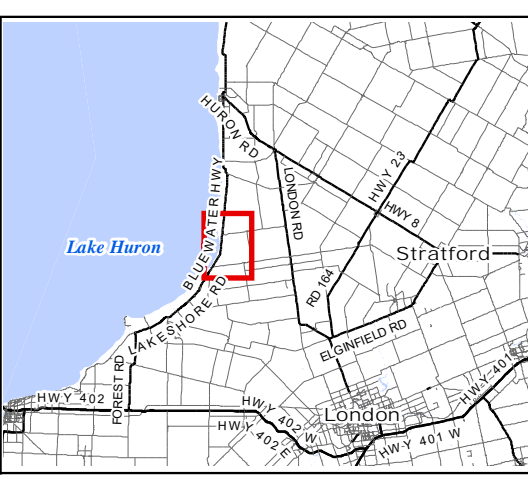
- Utility Line
- Highway
- Primary Road
- Secondary Road

**Project Components**

- Turbine (Non-subset)
- Subset Turbine (Control; No Deterrent)
- Subset Turbine (Treatment; Acoustic Bat Deterrent)
- Operations & Maintenance Building
- Substation

**Natural Features**

- Access Road
- Permanent Watercourse
- Intermittent Watercourse
- Water Body
- Provincially Significant Wetland (PSW)
- Other Wetland (Non-PSW)
- Unevaluated Wetland
- Wooded Area



**Map 1**

## Grand Bend Wind Farm Post-construction Monitoring Locations

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

0 500 1,000 1,500 2,000 Meters

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

**Project: 2408C**  
**Date: January 11, 2023**  
NAD83 - UTM Zone 17  
Scale 1:50,000 (11x17")

**Appendix I**  
Post-construction Monitoring Data Sheets

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# 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.)**

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## 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)



# Searcher Efficiency Data Form

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

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

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

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

## WEATHER

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

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

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

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

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

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

N ↑

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

# Visibility Class Map

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

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

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

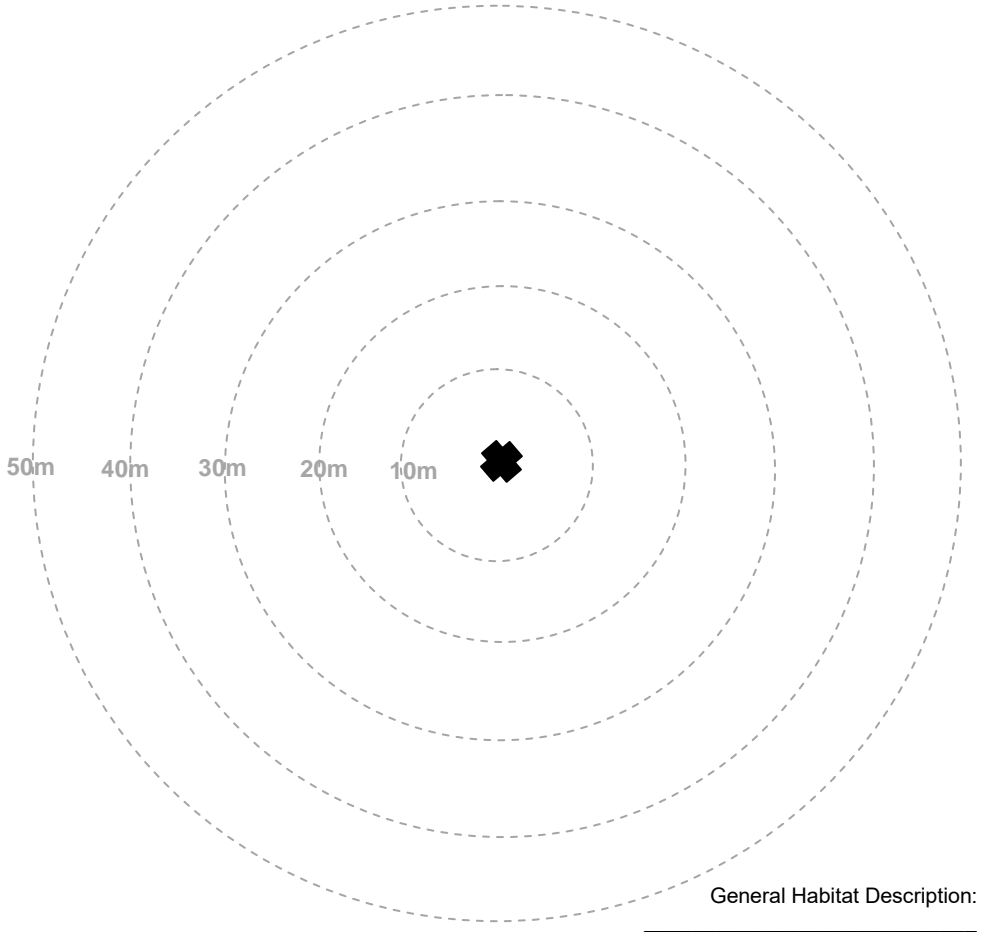
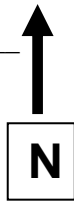
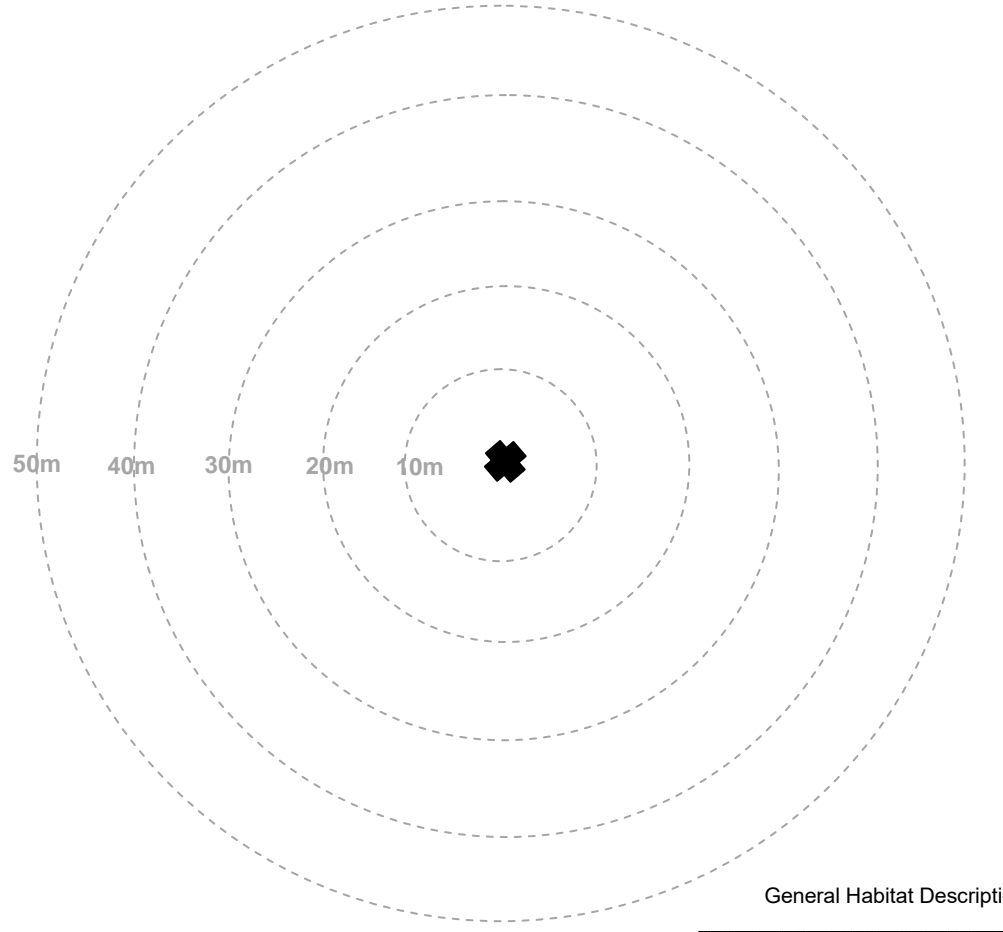
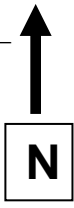


Photo Numbers (from turbine base)  
 Facing North: \_\_\_\_\_  
 Facing East: \_\_\_\_\_  
 Facing South: \_\_\_\_\_  
 Facing West: \_\_\_\_\_  
 (sketch habitat and visibility classes)

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



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

**Appendix II**  
Scavenger Removal Trial Results

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Appendix II  
 2408C Grand Bend Wind Farm  
 Scavenger Removal Trial Results 2022

Spring (May/June) 2022 Scavenger Removal Trial

Carcass Number	Turbine	Species	Distance from Turbine Base (m)	Direction from Turbine Base (°)	UTM (Zone 17T)		Visibility Class	Trial Day	Date	Carcass Present (Y/N)	Signs of Scavenging	Observer
					Easting	Northing						
1	T02	Red-winged Blackbird	32	120	444021	4811741	1	Day 0	05-May-22	Y	Carcass placed	Search Team A
								Day 4	09-May-22	Y	None	Search Team A
								Day 7	12-May-22	Y	None	Search Team A
								Day 11	16-May-22	Y	None	Search Team A
								Day 14	19-May-22	Y	None	Search Team A
2	T16	Silver-haired Bat	50	150	443909	4807563	2	Day 0	5-May-22	Y	Carcass placed	Search Team A
								Day 4	09-May-22	N	Carcass removed	Search Team A
								Day 7	12-May-22	N	N/A	Search Team A
								Day 11	16-May-22	N	N/A	Search Team A
								Day 14	19-May-22	N	N/A	Search Team A
3	T20	Hoary Bat	5	207	446912	4804820	1	Day 0	5-May-22	Y	Carcass placed	Search Team A
								Day 4	09-May-22	N	Carcass removed	Search Team A
								Day 7	12-May-22	N	N/A	Search Team A
								Day 11	16-May-22	N	N/A	Search Team A
								Day 14	19-May-22	N	N/A	Search Team A
4	T18	Red-eyed Vireo	15	280	443702	4805335	1	Day 0	09-May-22	Y	Carcass placed	Search Team A
								Day 3	12-May-22	N	Carcass removed	Search Team A
								Day 7	16-May-22	N	N/A	Search Team A
								Day 10	19-May-22	N	N/A	Search Team A
								Day 14	23-May-22	N	N/A	Search Team A
5	T17	Eastern Red Bat	41	49	448409	4805377	1	Day 0	09-May-22	Y	Carcass placed	Search Team A
								Day 3	12-May-22	N	Carcass removed	Search Team A
								Day 7	16-May-22	N	N/A	Search Team A
								Day 10	19-May-22	N	N/A	Search Team A
								Day 14	23-May-22	N	N/A	Search Team A
6	T48	American Robin	33	330	440536	4796587	1	Day 0	03-Jun-22	Y	Carcass placed	Search Team A
								Day 4	07-Jun-22	N	Carcass removed	Search Team A
								Day 7	10-Jun-22	N	N/A	Search Team A
								Day 11	14-Jun-22	N	N/A	Search Team A
								Day 14	17-Jun-22	N	N/A	Search Team A
7	T42	Silver-haired Bat	49	90	441647	4797876	2	Day 0	03-Jun-22	Y	Carcass placed	Search Team A
								Day 4	07-Jun-22	N	Carcass removed	Search Team A
								Day 7	10-Jun-22	N	N/A	Search Team A
								Day 11	14-Jun-22	N	N/A	Search Team A
								Day 14	17-Jun-22	N	N/A	Search Team A
8	T38	Red-eyed Vireo	7	95	442413	4799490	2	Day 0	03-Jun-22	Y	Carcass placed	Search Team A
								Day 4	07-Jun-22	N	Carcass removed	Search Team A
								Day 7	10-Jun-22	N	N/A	Search Team A
								Day 11	14-Jun-22	-	N/A	Search Team A
								Day 14	17-Jun-22	N	N/A	Search Team A
9	T27	Horned Lark	25	300	443606	4803693	2	Day 0	03-Jun-22	Y	Carcass placed	Search Team A
								Day 4	07-Jun-22	Y	None	Search Team A
								Day 7	10-Jun-22	N	Only wing and feathers remain	Search Team A
								Day 11	14-Jun-22	N	No further signs	Search Team A
								Day 14	17-Jun-22	N	No further signs	Search Team A
10	T31	Hoary Bat	13	100	443552	4801109	2	Day 0	14-Jun-22	Y	Carcass placed	Search Team A
								Day 4	17-Jun-22	Y	None	Search Team A
								Day 7	21-Jun-22	Y	None	Search Team A
								Day 11	24-Jun-22	Y	None	Search Team A
								Day 14	28-Jun-22	Y	None	Search Team A

Summer (July/August) 2022 Scavenger Removal Trial

Carcass Number	Turbine	Species	Distance from Turbine Base (m)	Direction from Turbine Base (°)	UTM (Zone 17T)		Visibility Class	Trial Day	Date	Carcass Present (Y/N)	Signs of Scavenging	Observer
					Easting	Northing						
1	T02	Hoary Bat	11	60	444386	4811759	1	Day 0	4-Jul-22	Y	Carcass placed	Search Team A
								Day 3	7-Jul-22	Y	None	Search Team A
								Day 7	11-Jul-22	N	Carcass removed	Search Team A
								Day 10	14-Jul-22	N	N/A	Search Team A
								Day 14	18-Jul-22	N	N/A	Search Team A
2	T20	Black-capped Chickadee	33	340	446830	4804817	1	Day 0	4-Jul-22	Y	Carcass placed	Search Team A
								Day 3	7-Jul-22	Y	None	Search Team A
								Day 7	11-Jul-22	Y	None	Search Team A
								Day 10	14-Jul-22	Y	None	Search Team A
								Day 14	18-Jul-22	Y	None	Search Team A
3	T16	Blue Jay	24	340	443891	4807636	2	Day 0	4-Jul-22	Y	Carcass placed	Search Team A
								Day 3	7-Jul-22	Y	None	Search Team A
								Day 7	11-Jul-22	N	Carcass removed	Search Team A
								Day 10	14-Jul-22	N	N/A	Search Team A
								Day 14	18-Jul-22	N	N/A	Search Team A
4	T18	Silver-haired Bat	0	10	443719	4805398	1	Day 0	4-Jul-22	Y	Carcass placed	Search Team A
								Day 3	7-Jul-22	Y	None	Search Team A
								Day 7	11-Jul-22	N	Carcass removed	Search Team A
								Day 10	14-Jul-22	N	N/A	Search Team A
								Day 14	18-Jul-22	N	N/A	Search Team A
5	T17	Golden-crowned Kinglet	46	190	443379	4805310	1	Day 0	4-Jul-22	Y	Carcass placed	Search Team A
								Day 3	7-Jul-22	Y	None	Search Team A
								Day 7	11-Jul-22	N	Carcass removed	Search Team A
								Day 10	14-Jul-22	N	N/A	Search Team A
								Day 14	18-Jul-22	N	N/A	Search Team A
6	T33	Silver-haired Bat	13	245	442828	4803455	2	Day 0	2-Aug-22	Y	Carcass placed	Search Team A
								Day 3	5-Aug-22	Y	Partially scavenged	Search Team A
								Day 7	9-Aug-22	N	Carcass removed	Search Team A
								Day 10	12-Aug-22	N	N/A	Search Team A
								Day 14	16-Aug-22	N	N/A	Search Team A
7	T31	Black-capped Chickadee	8	10	443544	4801116	1	Day 0	3-Aug-22	Y	Carcass placed	Search Team A
								Day 3	6-Aug-22	Y	None	Search Team A
								Day 7	10-Aug-22	Y	None	Search Team A
								Day 10	13-Aug-22	Y	None	Search Team A
								Day 14	17-Aug-22	Y	None	Search Team A
8	T48	Cedar Waxwing	36	60	440563	4796575	2	Day 0	3-Aug-22	Y	Carcass placed	Search Team A
								Day 3	6-Aug-22	N	Carcass removed	Search Team A
								Day 7	10-Aug-22	N	N/A	Search Team A
								Day 10	13-Aug-22	N	N/A	Search Team A
								Day 14	17-Aug-22	N	N/A	Search Team A
9	T42	Hoary Bat	47	345	441614	4797902	2	Day 0	6-Aug-22	Y	Carcass placed	Search Team A
								Day 3	10-Aug-22	Y	None	Search Team A
								Day 7	13-Aug-22	N	Carcass removed	Search Team A
								Day 10	17-Aug-22	N	N/A	Search Team A
								Day 14	20-Aug-22	N	N/A	Search Team A
10	T38	Gray Catbird	24	100	442433	4799483	2	Day 0	10-Aug-22	Y	Carcass placed	Search Team A
								Day 3	13-Aug-22	Y	None	Search Team A
								Day 7	17-Aug-22	Y	None	Search Team A
								Day 10	20-Aug-22	Y	None	Search Team A
								Day 14	24-Aug-22	Y	None	Search Team A

Fall (September/October) 2022 Scavenger Removal Trial

Carcass Number	Turbine	Species	Distance from Turbine Base (m)	Direction from Turbine Base (°)	UTM (Zone 17T)		Visibility Class	Trial Day	Date	Carcass Present (Y/N)	Signs of Scavenging	Observer
					Easting	Northing						
1	T07	Ovenbird	18	0	443960	4809163	1	Day 0	1-Sep-22	Y	Carcass placed	Search Team A
								Day 4	5-Sep-22	N	Carcass removed	Search Team A
								Day 7	8-Sep-22	N	N/A	Search Team A
								Day 11	12-Sep-22	N	N/A	Search Team A
								Day 15	15-Sep-22	N	N/A	Search Team A
2	T16	Eastern Red Bat	46	200	443874	4807568	2	Day 0	1-Sep-22	Y	Carcass placed	Search Team A
								Day 4	5-Sep-22	N	Carcass removed	Search Team A
								Day 7	8-Sep-22	N	N/A	Search Team A
								Day 11	12-Sep-22	N	N/A	Search Team A
								Day 14	15-Sep-22	N	N/A	Search Team A
3	T18	Yellow-bellied Sapsucker	30	160	443376	4805305	1	Day 0	1-Sep-22	Y	Carcass placed	Search Team A
								Day 4	5-Sep-22	Y	Only feathers remain	Search Team A
								Day 7	8-Sep-22	N	Carcass removed	Search Team A
								Day 11	12-Sep-22	N	N/A	Search Team A
								Day 14	15-Sep-22	N	N/A	Search Team A
4	T17	Silver-haired Bat	21	10	443379	4805378	1	Day 0	1-Sep-22	Y	Carcass placed	Search Team A
								Day 4	5-Sep-22	Y	Only wings and fur remain	Search Team A
								Day 7	8-Sep-22	N	Carcass removed	Search Team A
								Day 11	12-Sep-22	N	N/A	Search Team A
								Day 14	15-Sep-22	N	N/A	Search Team A
5	T20	Ruby-crowned Kinglet	5	60	446917	4804827	1	Day 0	1-Sep-22	Y	Carcass placed	Search Team A
								Day 4	5-Sep-22	Y	None	Search Team A
								Day 7	8-Sep-22	Y	None	Search Team A
								Day 11	12-Sep-22	Y	None	Search Team A
								Day 14	15-Sep-22	Y	None	Search Team A
6	T48	Warbler sp.	24	230	440507	4796537	2	Day 0	4-Oct-22	Y	Carcass placed	Search Team A
								Day 3	7-Oct-22	N	Carcass removed	Search Team A
								Day 7	11-Oct-22	N	N/A	Search Team A
								Day 10	14-Oct-22	N	N/A	Search Team A
								Day 14	18-Oct-22	N	N/A	Search Team A
7	T42	Silver-haired Bat	31	90	441640	4797854	2	Day 0	4-Oct-22	Y	Carcass placed	Search Team A
								Day 3	7-Oct-22	N	Carcass removed	Search Team A
								Day 7	11-Oct-22	N	N/A	Search Team A
								Day 10	14-Oct-22	N	N/A	Search Team A
								Day 14	18-Oct-22	N	N/A	Search Team A
8	T38	Northern Flicker	42	320	442380	4799526	1	Day 0	4-Oct-22	Y	Carcass placed	Search Team A
								Day 3	7-Oct-22	Y	None	Search Team A
								Day 7	11-Oct-22	Y	None	Search Team A
								Day 10	14-Oct-22	Y	None	Search Team A
								Day 14	18-Oct-22	Y	None	Search Team A
9	T33	Silver-haired Bat	12	0	442834	4800479	2	Day 0	4-Oct-22	Y	Carcass placed	Search Team A
								Day 3	7-Oct-22	N	Carcass removed	Search Team A
								Day 7	11-Oct-22	N	N/A	Search Team A
								Day 10	14-Oct-22	N	N/A	Search Team A
								Day 14	18-Oct-22	N	N/A	Search Team A
10	T31	Nashville Warbler	5	350	443539	4801118	1	Day 0	4-Oct-22	Y	Carcass placed	Search Team A
								Day 3	7-Oct-22	Y	None	Search Team A
								Day 7	11-Oct-22	N	Carcass removed	Search Team A
								Day 10	14-Oct-22	N	N/A	Search Team A
								Day 14	18-Oct-22	N	N/A	Search Team A

**Appendix III**  
Searcher Efficiency Trial Results

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**Appendix III  
2408C Grand Bend Wind Farm  
Searcher Efficiency Trial Results 2022**

**May 2022 Searcher Efficiency Trial**

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
5-May-22	Search Team A	1	T02	Blue Jay	46	342	Bare soil	1	444347	4811802	Y	-
		2	T07	Hoary Bat	14	57	Gravel	1	443966	4809156	Y	-
		3	T18	Horned Lark	41	238	Bare soil	1	443689	4805307	N	Y
6-May-22	Search Team A	4	T42	Eastern Red Bat	25	353	Grass	2	441592	4797875	Y	-
		5	T38	Cedar Waxwing	7	60	Grass	2	442415	4799488	Y	-
		6	T33	Gray Catbird	34	193	Grass	2	442833	4800430	Y	-
9-May-22	Search Team A	7	T20	Red-eyed Vireo	21	285	Gravel	1	446890	4804833	Y	-
		8	T17	Hoary Bat	14	52	Bare soil	1	443389	4805366	N	N
		9	T16	Baltimore Oriole	37	37	Bare soil	1	443936	4807607	N	Y
10-May-22	Search Team A	10	T48	American Robin	17	84	Grass	2	440547	4796552	N	N
		11	T42	Red-eyed Vireo	42	182	Grass	2	441609	4797810	Y	-
		12	T33	Hoary Bat	27	355	Grass	2	442832	4800491	N	Y
13-May-22	Search Team A	13	T48	Silver-haired Bat	45	288	Grass	2	440483	4796558	Y	-
		14	T42	Yellow-bellied Sapsucker	29	124	Grass	2	441629	4797832	Y	-
		15	T38	Hoary Bat	29	315	Grass	2	442814	4800480	Y	-
16-May-22	Search Team A	16	T02	Blackburnian Warbler	10	271	Bare soil	1	444357	4811756	Y	-
		17	T07	Ruby-crowned Kinglet	3	3	Bare soil	1	443956	4807183	N	N
		18	T20	Silver-haired Bat	45	45	Bare soil	1	446912	4804781	Y	-
19-May-22	Search Team A	19	T16	Eastern Red Bat	12	331	Grass	2	443885	4807619	Y	-
		20	T17	Silver-haired Bat	8	89	Bare soil	1	443386	4805356	Y	-
24-May-22	Search Team A	21	T31	Silver-haired Bat	44	281	Bare soil	1	443495	4801105	Y	-
		22	T38	Red-eyed Vireo	19	68	Grass	2	442433	4799505	N	N

**June 2022 Searcher Efficiency Trial**

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
2-Jun-22	Search Team A	1	T20	American Robin	33	62	Bare soil	1	446943	4804851	Y	-
		2	T18	Eastern Red Bat	19	160	Gravel	1	443720	4805321	N	Y
		3	T02	Ruby-crowned Kinglet	41	321	Bare soil	1	444337	4811778	Y	-
10-Jun-22	Search Team A	4	T33	Northern Flicker	39	312	Gravel	1	442801	4800486	Y	-
		5	T31	Golden-crowned Kinglet	14	259	Bare soil	1	443528	4801102	Y	-
		6	T27	Hoary Bat	40	204	Bare soil	1	443617	4808644	N	N
14-Jun-22	Search Team A	7	T48	Wilson's Warbler	7	261	Grass	2	440521	4796550	N	N
		8	T42	Yellow-bellied Sapsucker	16	80	Grass	2	441624	4797849	Y	-

**June 2022 Searcher Efficiency Trial (Continued)**

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
17-Jun-22	Search Team A	9	T48	Hoary Bat	31	61	Grass	2	440557	4796572	N	N
		10	T33	Black-capped Chickadee	24	303	Grass	2	442815	4800475	Y	-
		11	T42	Silver-haired Bat	45	262	Grass	2	441562	4791842	Y	-
20-Jun-22	Search Team A	12	T18	Hoary Bat	8	306	Gravel	1	443786	4805336	Y	-
		13	T07	Silver-haired Bat	25	321	Bare soil	1	443936	4809170	N	Y
21-Jun-22	Search Team A	14	T42	American Robin	45	150	Grass	2	441634	4797813	N	N
		15	T33	Hoary Bat	8	268	Grass	2	442878	4800462	Y	-
		16	T38	Black-capped Chickadee	29	121	Grass	2	442433	4799476	Y	-
23-Jun-22	Search Team A	17	T16	Silver-haired Bat	34	300	Grass	2	443875	4799479	Y	-
		18	T18	White-throated Sparrow	7	20	Bare soil	1	443721	4800444	N	Y
		19	T20	Hoary Bat	25	29	Bare soil	1	446943	4804851	Y	-
27-Jun-22	Search Team A	20	T02	Silver-haired Bat	18	90	Bare soil	1	444394	4811758	N	N
		21	T07	Hoary Bat	35	150	Bare soil	1	443966	4809114	N	N
		22	T17	Ruby-crowned Kinglet	32	350	Bare soil	1	443363	4805389	Y	-

**July 2022 Searcher Efficiency Trial**

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
07-Jul-22	Search Team A	1	T02	Hoary Bat	28	63	Bare soil	1	444399	4811717	Y	-
		2	T18	Horned Lark	43	139	Bare soil	1	443756	4805308	Y	-
		3	T20	Black-capped Chickadee	11	10	Bare soil	1	446913	4804837	Y	-
08-Jul-22	Search Team A	4	T48	Silver-haired Bat	16	350	Grass	2	440551	4796373	Y	-
		5	T33	Tree Swallow	32	161	Grass	2	440526	4800437	Y	-
		6	T38	Golden-crowned Kinglet	8	75	Grass	2	442854	4799488	Y	-
11-Jul-22	Search Team A	7	T20	Eastern Kingbird	45	140	Bare soil	1	446946	4804795	Y	-
		8	T17	Silver-haired Bat	7	68	Bare soil	1	443382	4805344	N	Y
		9	T07	Black-capped Chickadee	33	325	Bare soil	1	443929	4809175	Y	-
12-Jul-22	Search Team A	10	T31	Hoary Bat	13	160	Bare soil	1	443542	4801099	Y	-
		11	T38	Black-capped Chickadee	45	26	Grass	2	442434	4799532	Y	-
		12	T42	Silver-haired Bat	28	138	Grass	2	441633	4797839	Y	-
14-Jul-22	Search Team A	13	T16	Hoary Bat	45	340	Grass	2	443872	4807653	Y	-
		14	T07	Wilson's Warbler	32	180	Bare soil	1	443959	4809115	N	N
		15	T02	Purple Martin	26	54	Bare soil	1	444398	4811774	Y	-
19-Jul-22	Search Team A	16	T48	Black-and -white Warbler	37	25	Grass	2	440533	4795595	Y	-
		17	T42	Yellow-billed Cuckoo	46	260	Grass	2	441566	4797828	Y	-
		18	T33	Hoary Bat	15	45	Grass	2	442851	4800476	N	Y
21-Jul-22	Search Team A	19	T18	Silver-haired Bat	27	330	Bare soil	1	443696	4805358	Y	-
		20	T16	Eastern Red Bat	41	130	Grass	2	443929	4807583	N	Y

**August 2022 Searcher Efficiency Trial**

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
04-Aug-22	Search Team A	1	T07	Horned Lark	43	65	Bare soil	1	443982	4809185	Y	-
		2	T02	Silver-haired Bat	32	220	Bare soil	1	444358	4811733	Y	-
08-Aug-22	Search Team A	3	T20	Black-capped Chickadee	18	140	Bare soil	1	446925	4804811	Y	-
		4	T17	Purple Martin	22	260	Bare soil	1	443343	4805343	Y	-
		5	T07	Silver-haired Bat	5	18	Gravel	1	443958	4809153	Y	-
09-Aug-22	Search Team A	6	T31	Hoary Bat	5	314	Bare soil	1	443532	4801115	Y	-
		7	T33	Hoary Bat	25	350	Grass	2	442832	4804888	Y	-
		8	T38	Tree Swallow	43	212	Gravel	2	442385	4799456	Y	-
12-Aug-22	Search Team A	9	T48	Eastern Red Bat	17	195	Grass	2	440527	4796538	N	N
		10	T42	Northern Flicker	46	350	Grass	2	441603	4797899	Y	-
		11	T38	Golden-crowned Kinglet	35	30	Grass	2	442419	4799528	Y	-
15-Aug-22	Search Team A	12	T18	Yellow-bellied Sapsucker	50	150	Bare soil	1	443759	4805306	Y	-
		13	T16	Silver-haired Bat	32	350	Grass	2	443878	4801640	Y	-
16-Aug-22	Search Team A	14	T42	Hoary Bat	14	270	Grass	2	440519	4796599	Y	-
		15	T27	American Robin	45	180	Grass	2	442844	4800419	Y	-
18-Aug-22	Search Team A	16	T17	Ruby-crowned Kinglet	23	305	Bare soil	1	443355	4800370	Y	-
		17	T18	American Robin	41	100	Bare soil	1	443763	4805335	Y	-
		18	T02	Silver-haired Bat	7	240	Gravel	1	444374	4811753	Y	-
23-Aug-22	Search Team A	19	T48	Golden-crowned Kinglet	8	95	Grass	2	440537	4796552	N	N
		20	T42	Yellow-bellied Sapsucker	22	250	Grass	2	441585	4797842	Y	-

**September 2022 Searcher Efficiency Trial**

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
1-Sep-22	Search Team A	1	T20	Thrush sp.	31	320	Bare soil	1	446887	4804841	Y	-
		2	T16	Hoary Bat	12	10	Grass	2	443898	4807626	Y	-
6-Sep-22	Search Team A	3	T48	Black-capped Chickadee	36	260	Grass	2	440487	4796553	N	Y
		4	T33	Hoary Bat	8	25	Grass	2	442842	4800441	Y	-
		5	T38	American Robin	46	120	Grass	2	442444	4799462	Y	-
8-Sep-22	Search Team A	6	T18	European Starling	43	270	Bare soil	1	443674	4805332	Y	-
		7	T16	Hoary Bat	25	50	Grass	2	443915	4807631	N	Y
		8	T07	Hoary Bat	4	180	Gravel	1	443955	4809146	Y	-
12-Sep-22	Search Team A	9	T20	Silver-haired Bat	24	300	Bare soil	1	446890	4804835	Y	-
		10	T17	Baltimore Oriole	48	70	Bare soil	1	443421	4805374	Y	-
		11	T02	Golden-crowned Kinglet	7	5	Bare soil	1	444377	4811771	N	Y
15-Sep-22	Search Team A	12	T42	Cedar Waxwing	33	145	Grass	2	441628	4797827	Y	-
		13	T33	Black-capped Chickadee	45	5	Grass	2	442844	4800516	Y	-
		14	T38	Hoary Bat	18	285	Grass	2	442391	4799492	Y	-

**September 2022 Searcher Efficiency Trial (Continued)**

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
20-Sep-22	Search Team A	15	T31	Eastern Red Bat	20	350	Bare soil	1	443528	4801134	Y	-
		16	T33	Nuthatch sp.	28	265	Grass	2	442808	4800462	N	N
		17	T38	Hoary Bat	6	278	Grass	2	442405	4799489	Y	-
22-Sep-22	Search Team A	18	T18	Tree Swallow	30	360	Bare soil	1	443715	4805373	N	Y
		19	T17	Hoary Bat	42	140	Bare soil	1	443402	4803322	Y	-
		20	T07	Golden-crowned Kinglet	5	90	Gravel	1	443961	4809148	N	Y
26-Sep-22	Search Team A	21	T20	Northern Flicker	44	50	Bare soil	1	446951	4804861	Y	-
		22	T18	Black-capped Chickadee	9	120	Bare soil	1	443724	4805332	Y	-
		23	T07	Vireo sp.	25	220	Bare soil	1	443946	4809125	Y	-
30-Sep-22	Search Team A	24	T48	American Robin	36	90	Grass	2	440567	4796557	N	Y
		25	T42	Hoary Bat	24	295	Grass	2	441582	4797861	Y	-
		26	T31	Baltimore Oriole	14	270	Bare soil	1	443527	4801106	Y	-

**October 2022 Searcher Efficiency Trial**

Date	Searcher	No.	Turbine	Species	Distance (m)	Direction (°)	General Habitat	Visibility Class	UTM (Zone 17T)		Found (Y/N)	Scavenged (Y/N)
									Easting	Northing		
4-Oct-22	Search Team A	1	T48	European Starling	49	185	Grass	2	440517	4796507	N	Y
		2	T42	Silver-haired Bat	23	95	Grass	2	441630	4807847	N	Y
		3	T33	Black-capped Chickadee	8	235	Grass	2	442832	4800466	Y	-
6-Oct-22	Search Team A	4	T02	Hermit Thrush	33	140	Bare soil	1	444403	4811739	Y	-
		5	T18	Hoary Bat	43	70	Bare soil	1	443758	4805358	N	Y
		6	T17	Cedar Waxwing	22	180	Gravel	1	443379	4805324	N	Y
13-Oct-22	Search Team A	7	T07	Silver-haired Bat	23	310	Bare soil	1	443930	4809155	Y	-
		8	T16	Eastern Red Bat	37	245	Grass	2	443869	4807590	N	N
		9	T20	Hermit Thrush	9	90	Bare soil	1	446923	4804828	Y	-
14-Oct-22	Search Team A	10	T42	Black-capped Chickadee	26	165	Grass	2	441619	4797822	Y	-
		11	T48	Hoary Bat	13	320	Grass	2	440518	4796061	Y	-
		12	T33	Hermit Thrush	48	265	Grass	2	442794	4800445	Y	-
17-Oct-22	Search Team A	13	T02	Hoary Bat	5	90	Gravel	1	443801	4811761	Y	-
		14	T07	Purple Martin	48	4	Bare soil	1	443982	4809194	Y	-
		15	T17	Black-capped Chickadee	20	260	Bare soil	1	443357	4805345	Y	-
18-Oct-22	Search Team A	16	T31	Eastern Red Bat	14	302	Bare soil	1	443523	4801114	N	Y
		17	T33	Silver-haired Bat	16	266	Grass	2	442825	4800456	Y	-
		18	T42	Black-capped Chickadee	33	119	Grass	2	441639	4797842	N	Y
20-Oct-22	Search Team A	19	T16	Hoary Bat	43	299	Grass	2	443851	4807626	Y	-
		20	T18	Sparrow sp.	9	140	Bare soil	1	443723	4805331	Y	-
24-Oct-22	Search Team A	21	T07	Hoary Bat	41	290	Bare soil	1	443911	4809162	N	Y
		22	T18	Silver-haired Bat	25	240	Bare soil	1	443698	4805325	Y	-
		23	T20	Hoary Bat	32	340	Bare soil	1	446884	4804847	Y	-
28-Oct-22	Search Team A	24	T48	Purple Martin	49	70	Grass	2	440575	4795577	N	Y
		25	T42	Black-capped Chickadee	15	250	Grass	2	441395	4797842	Y	-
		26	T33	Baltimore Oriole	27	190	Grass	2	442839	4800441	Y	-



**Appendix IV**  
Visibility Class Mapping

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# Visibility Class Map

Project Name: Grand Bend Wf Project #: 2408C Turbine #: T02 Degree of Slope      degrees Slope Orientation      (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 2191  
 Facing East: 2269  
 Facing South: 1572  
 Facing West: 1922  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/05/22

Observer: MGB, KLR

Monthly/Seasonal  
 Linear Transect Width: 3 m

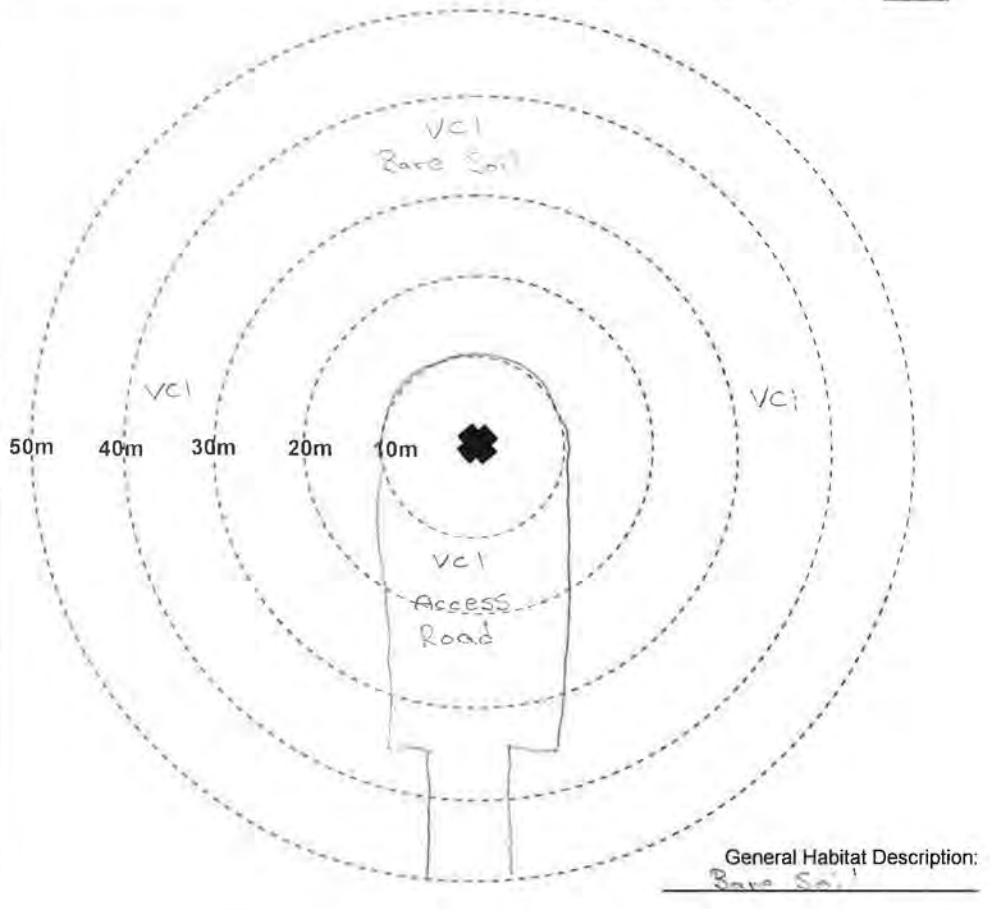
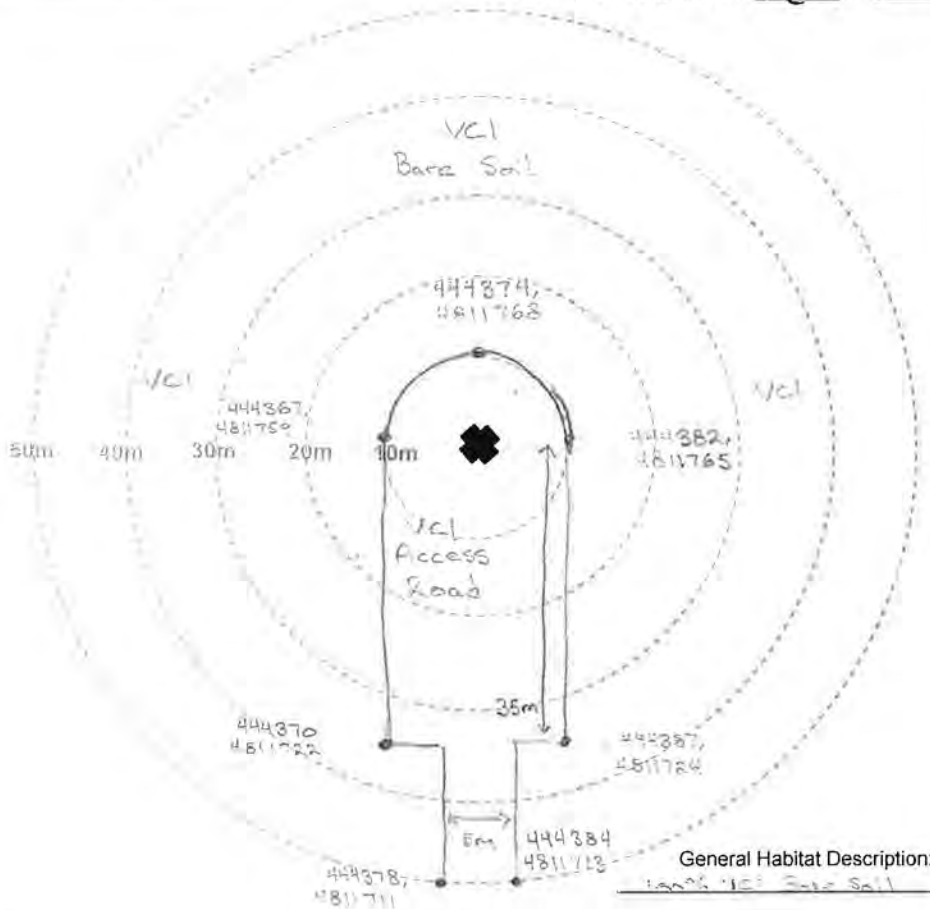


Photo Numbers (from turbine base)  
 Facing North: 2074  
 Facing East: 1726  
 Facing South: 2895  
 Facing West: 5110  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/06/22

Observer: MGB, KLR

Monthly/Seasonal  
 Linear Transect Width: 3 m



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

# Visibility Class Map

Project Name: Grand Bend LWF Project #: 2408c Turbine #: 02

Photo Numbers (from turbine base)  
 Facing North: 1688  
 Facing East: 6096  
 Facing South: 5486  
 Facing West: 5087  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04/07/22  
 Observer: VGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m

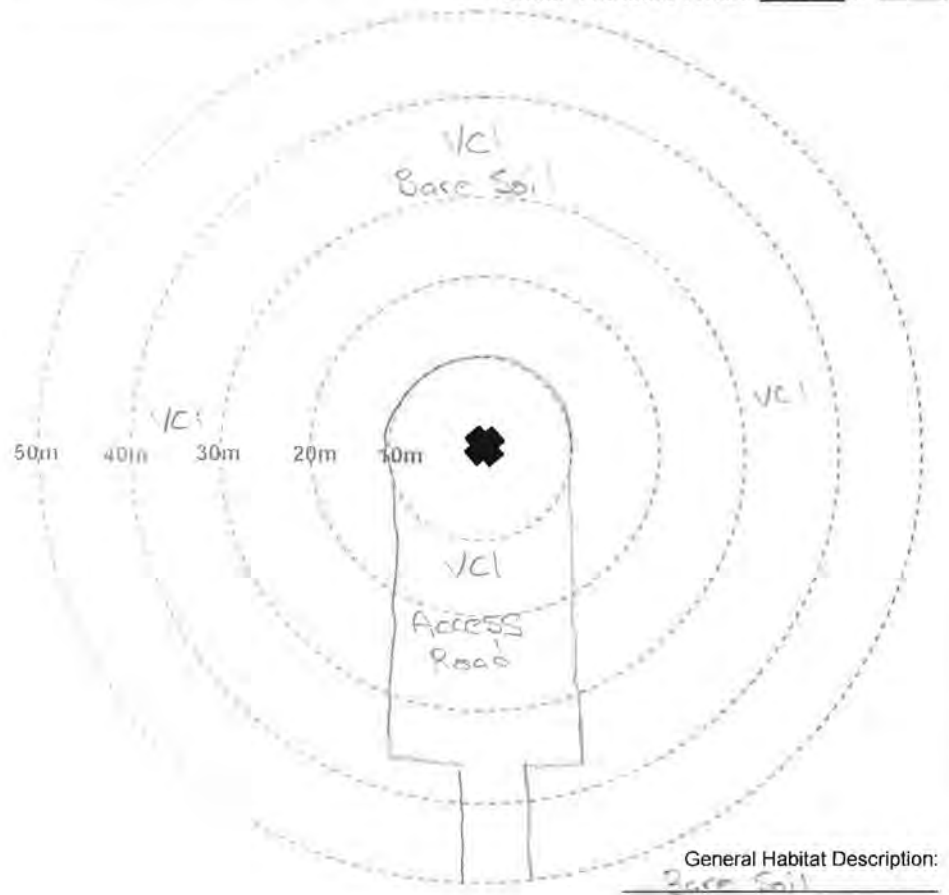
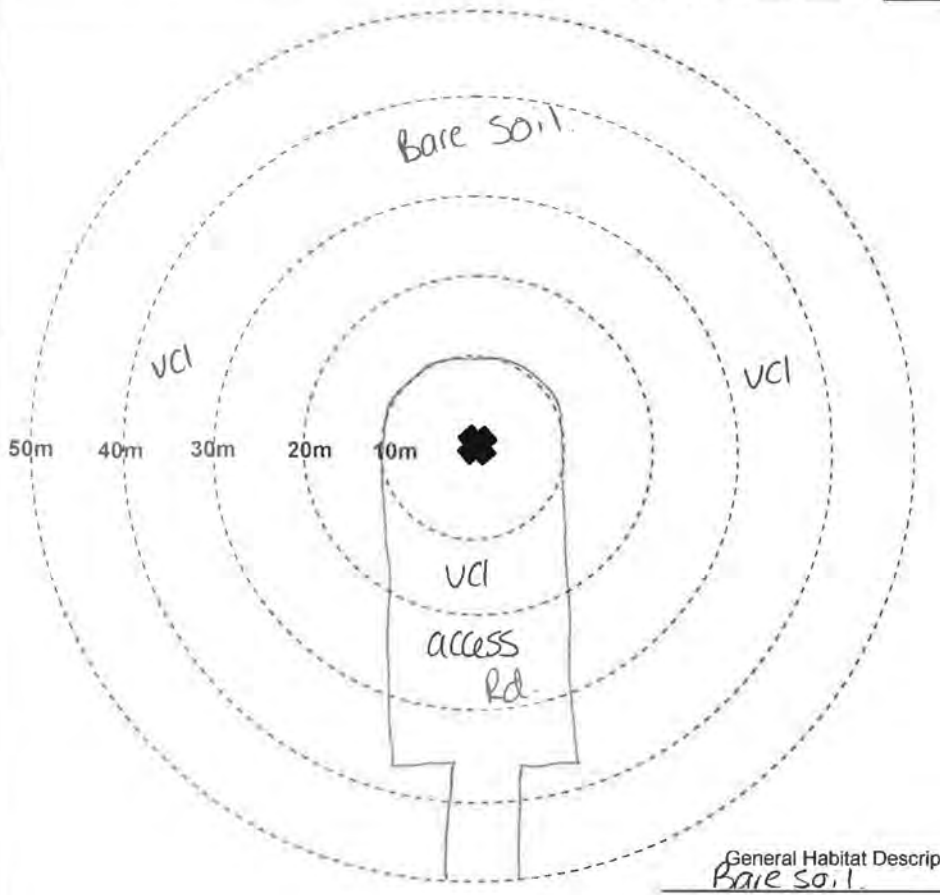


Photo Numbers (from turbine base)  
 Facing North: 084004  
 Facing East: 084010  
 Facing South: 084021  
 Facing West: 084028  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 01/08/22  
 Observer: UB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



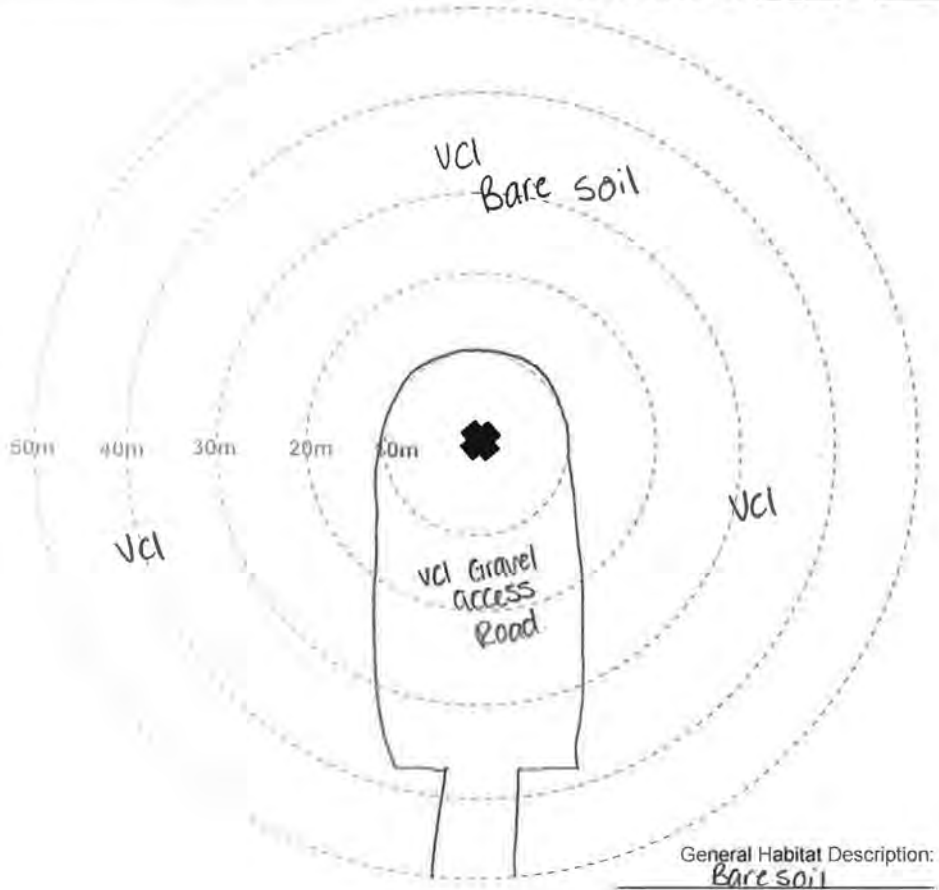
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

# Visibility Class Map

Project Name: Grand Bend WE Project #: 2408C Turbine #: T02

Photo Numbers (from turbine base)  
 Facing North: 083454  
 Facing East: 083502  
 Facing South: 083514  
 Facing West: 083523  
 (sketch habitat and visibility classes)

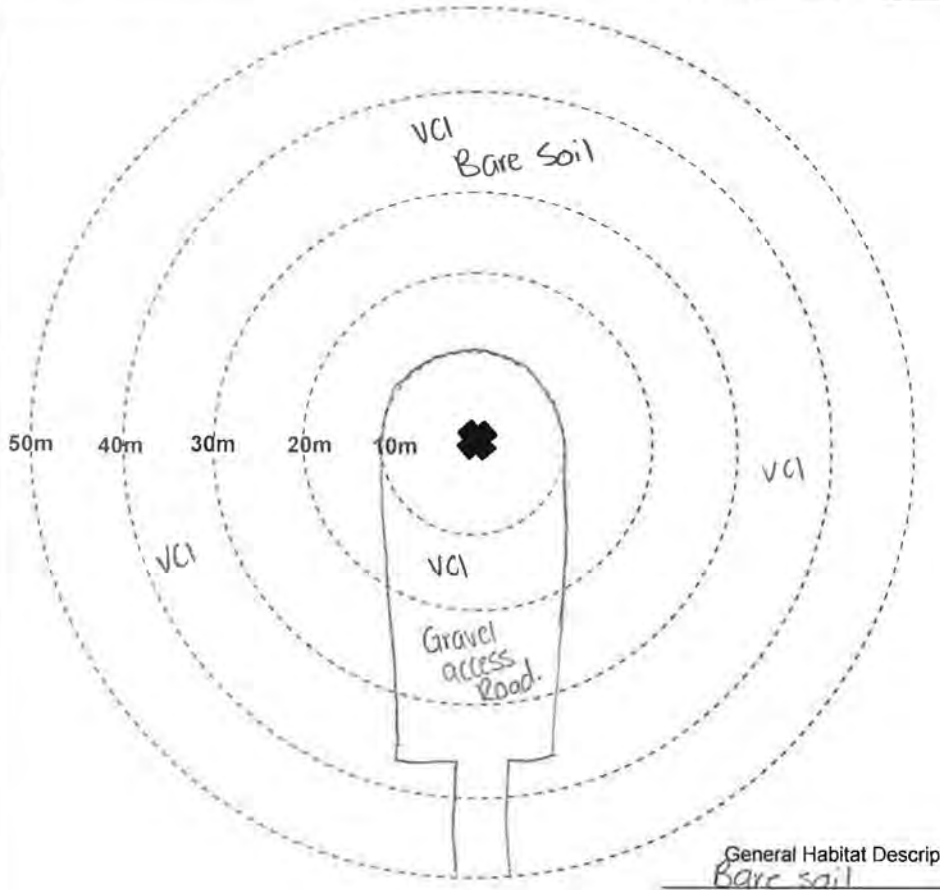
Date (DD/MM/YY): 01/09/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



General Habitat Description:  
Bare soil

Photo Numbers (from turbine base)  
 Facing North: 083609  
 Facing East: 083618  
 Facing South: 083628  
 Facing West: 083639  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



General Habitat Description:  
Bare soil

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: Grand Bend WJF Project #: 2408C Turbine #: 107 Degree of Slope      degrees Slope Orientation      (e.g. SSW)

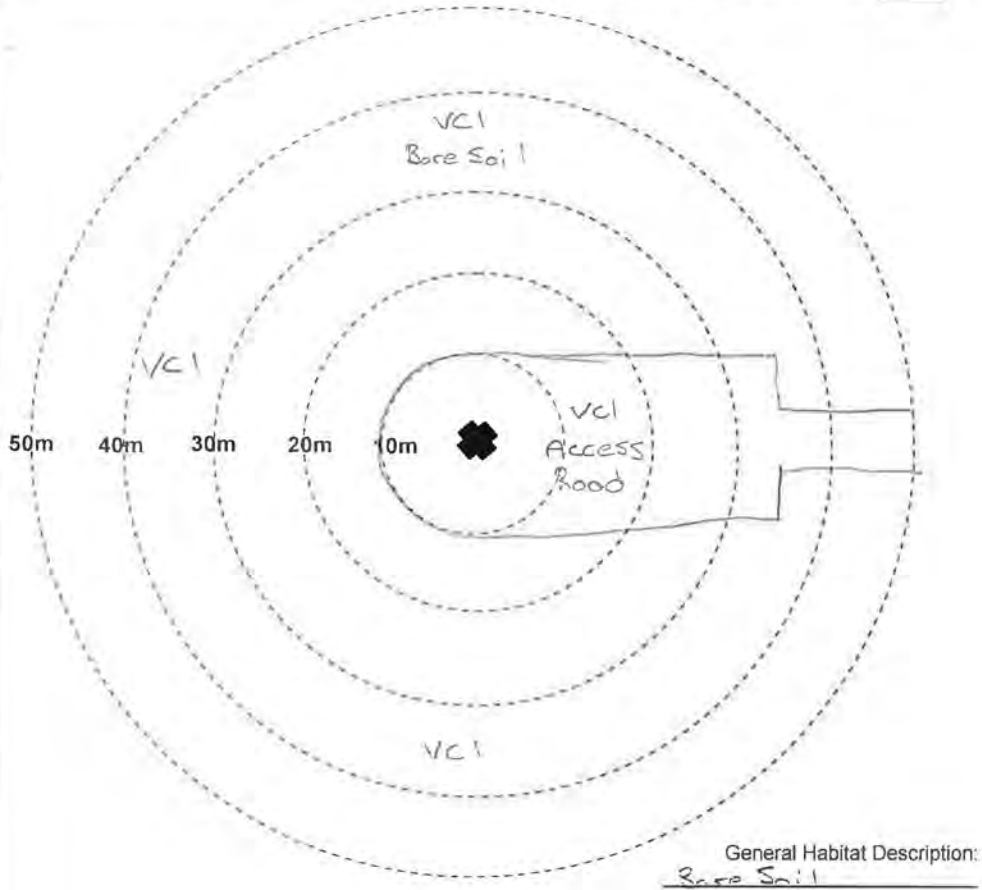
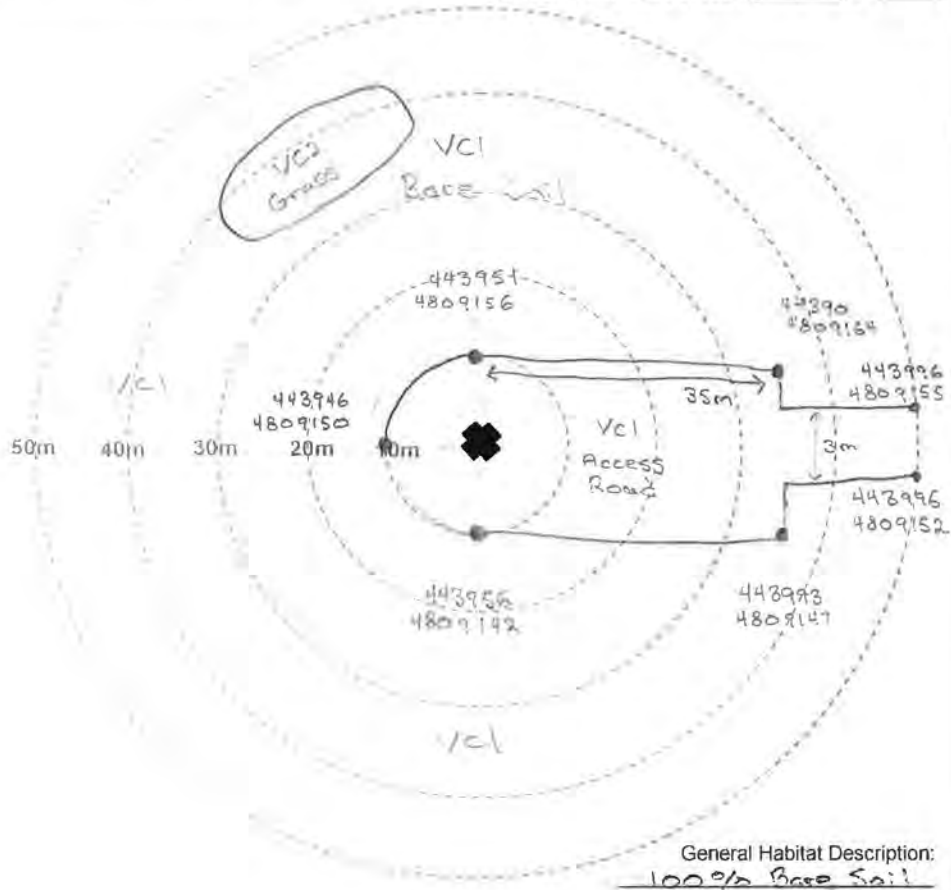
Photo Numbers (from turbine base)  
 Facing North: 5794  
 Facing East: 6064  
 Facing South: 5169  
 Facing West: 3056  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/05/22  
 Observer: MGB, KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



Photo Numbers (from turbine base)  
 Facing North: 4755  
 Facing East: 4287  
 Facing South: 3111  
 Facing West: 2241  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/06/22  
 Observer: MGB, KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



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

# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408c Turbine #: 67

Photo Numbers (from turbine base)  
 Facing North: 135030  
 Facing East: 135042  
 Facing South: 135054  
 Facing West: 135110  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04/07/22 ↑  
 Observer: MGB  
 Monthly/Seasonal Linear Transect Width: 3 m

N ↑

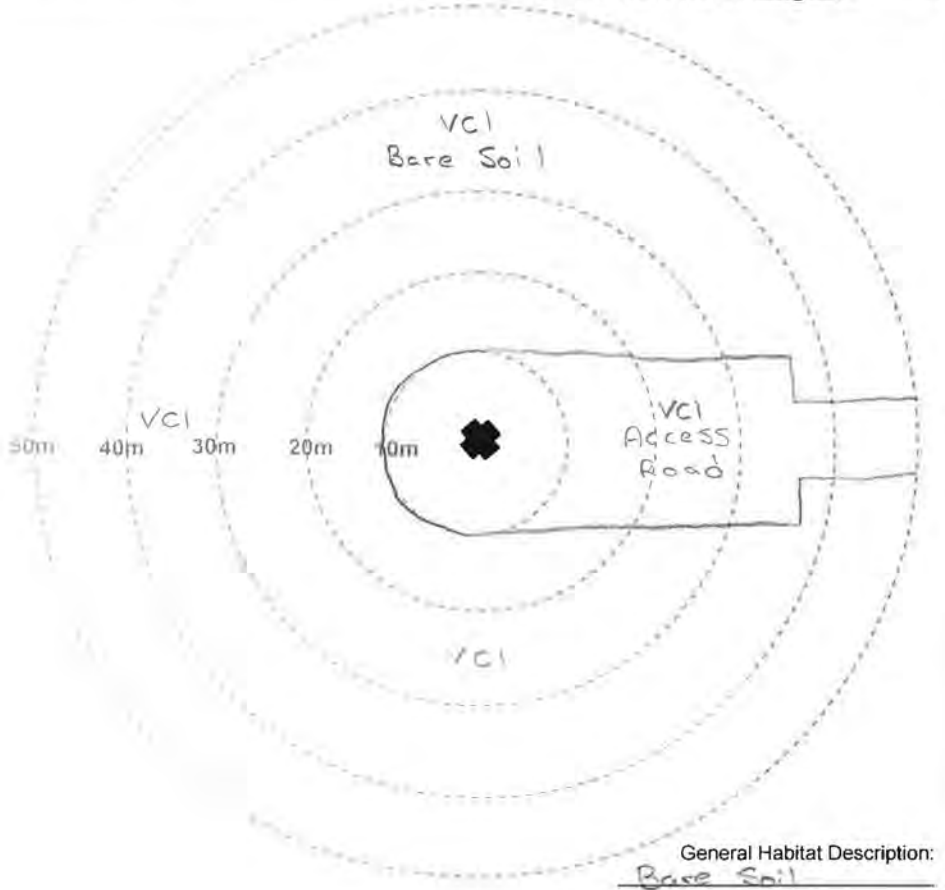
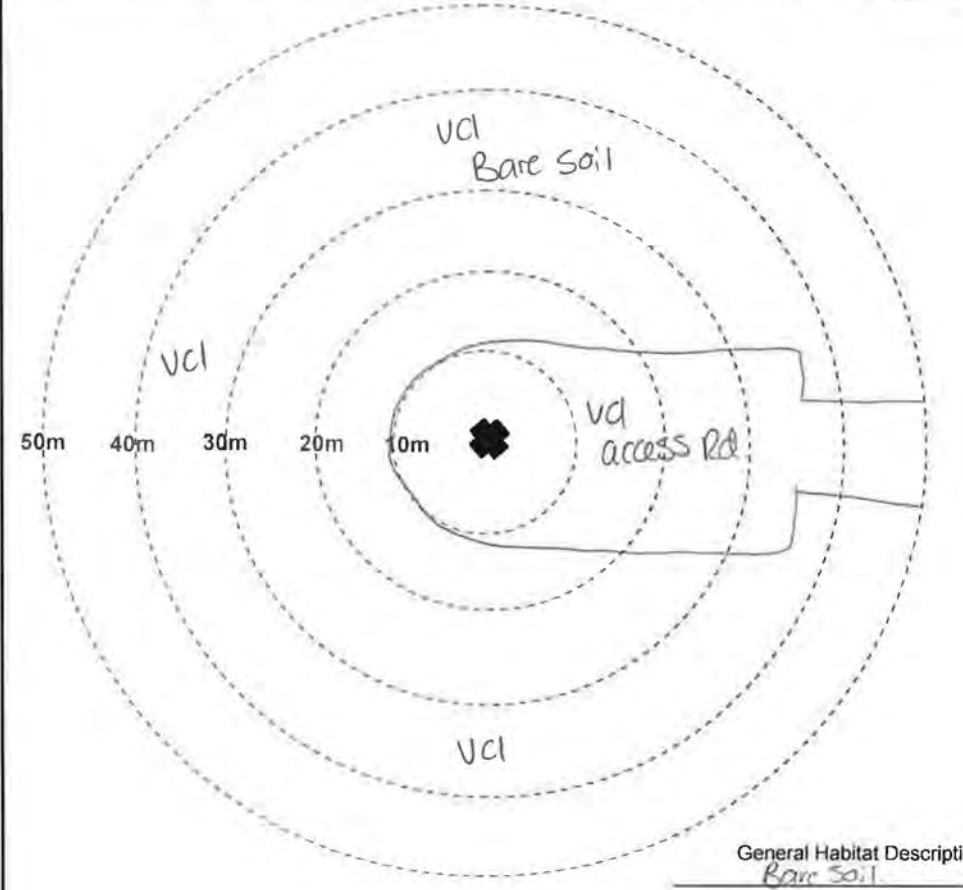


Photo Numbers (from turbine base)  
 Facing North: 093408  
 Facing East: 093415  
 Facing South: 093425  
 Facing West: 093433  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 01/08/22 ↑  
 Observer: KLB  
 Monthly/Seasonal Linear Transect Width: 3 m

N ↑



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

# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408C Turbine #: T07

Photo Numbers (from turbine base)  
 Facing North: 094127  
 Facing East: 094133  
 Facing South: 094140  
 Facing West: 094148  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 01/09/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m

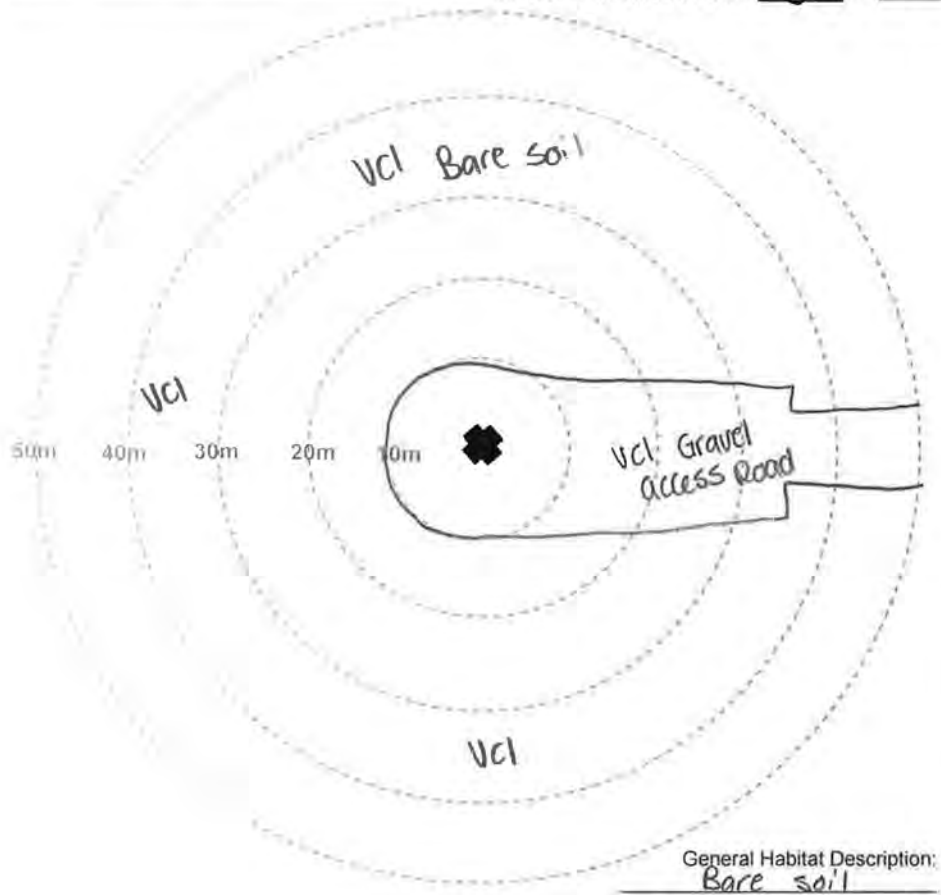
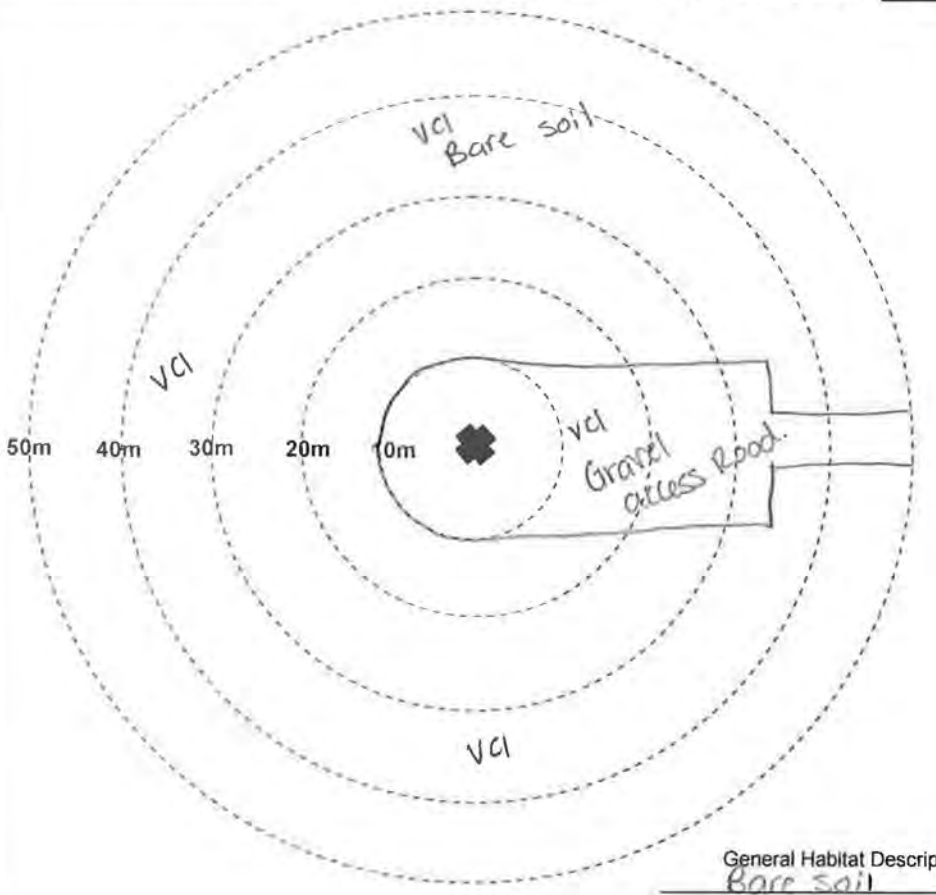


Photo Numbers (from turbine base)  
 Facing North: 091710  
 Facing East: 091719  
 Facing South: 091730  
 Facing West: 091743  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



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



# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408C Turbine #: T16 Degree of Slope      degrees Slope Orientation      (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 0890  
 Facing East: 2756  
 Facing South: 8507  
 Facing West: 9557  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/05/22  
 Observer: MGB, KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m

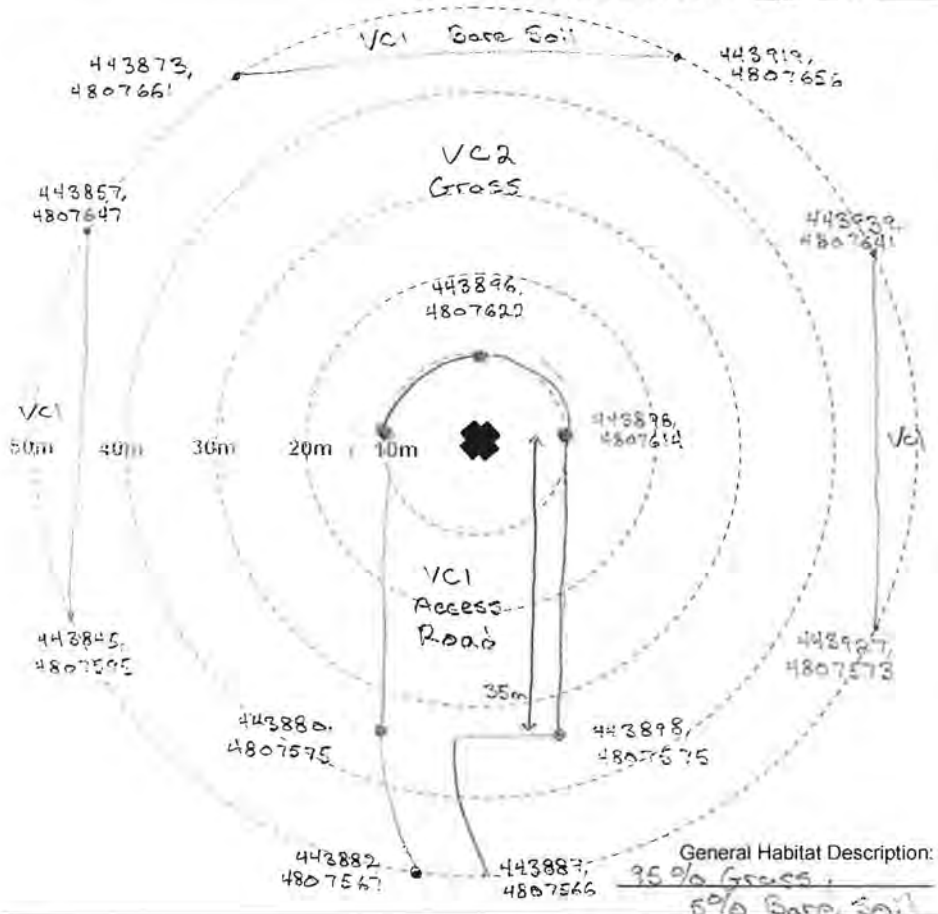
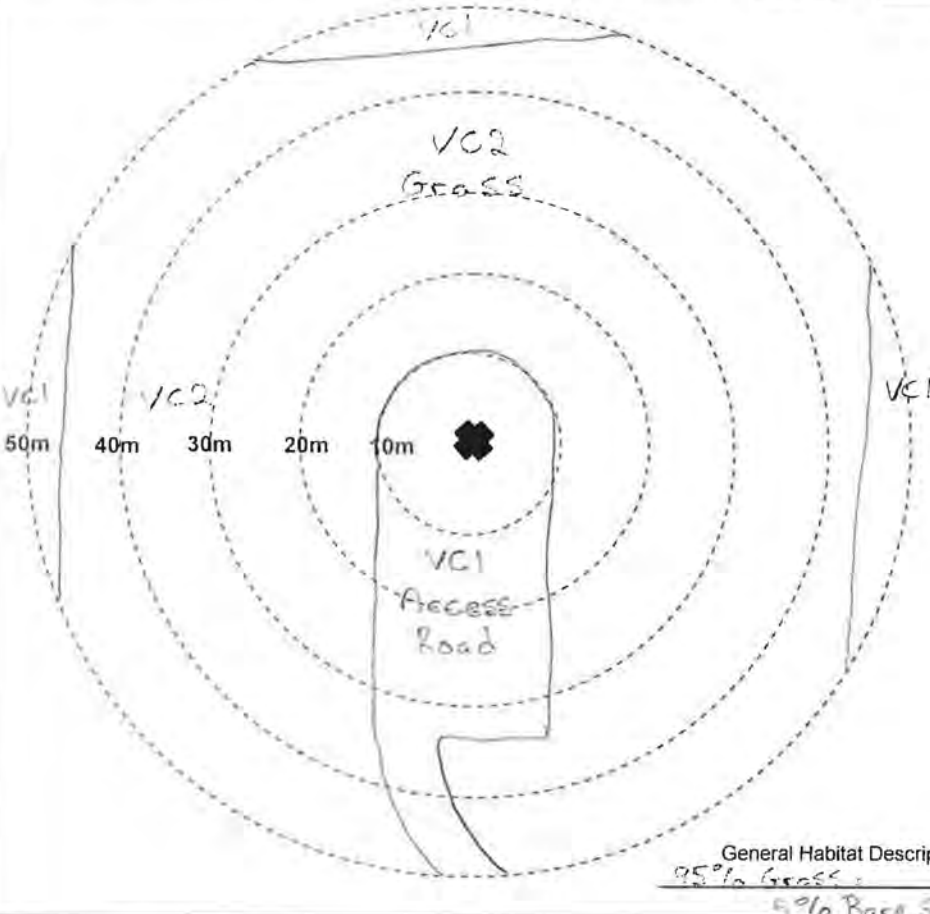


Photo Numbers (from turbine base)  
 Facing North: 0411  
 Facing East: 0438  
 Facing South: 0271  
 Facing West: 0474  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/06/22  
 Observer: MGB, KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



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



# Visibility Class Map

Project Name: Grand Bend WLF Project #: 2408c Turbine #: T16

Photo Numbers (from turbine base)  
 Facing North: 1215  
 Facing East: 2064  
 Facing South: 2165  
 Facing West: 1161  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04/07/22  
 Observer: MGB, KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m

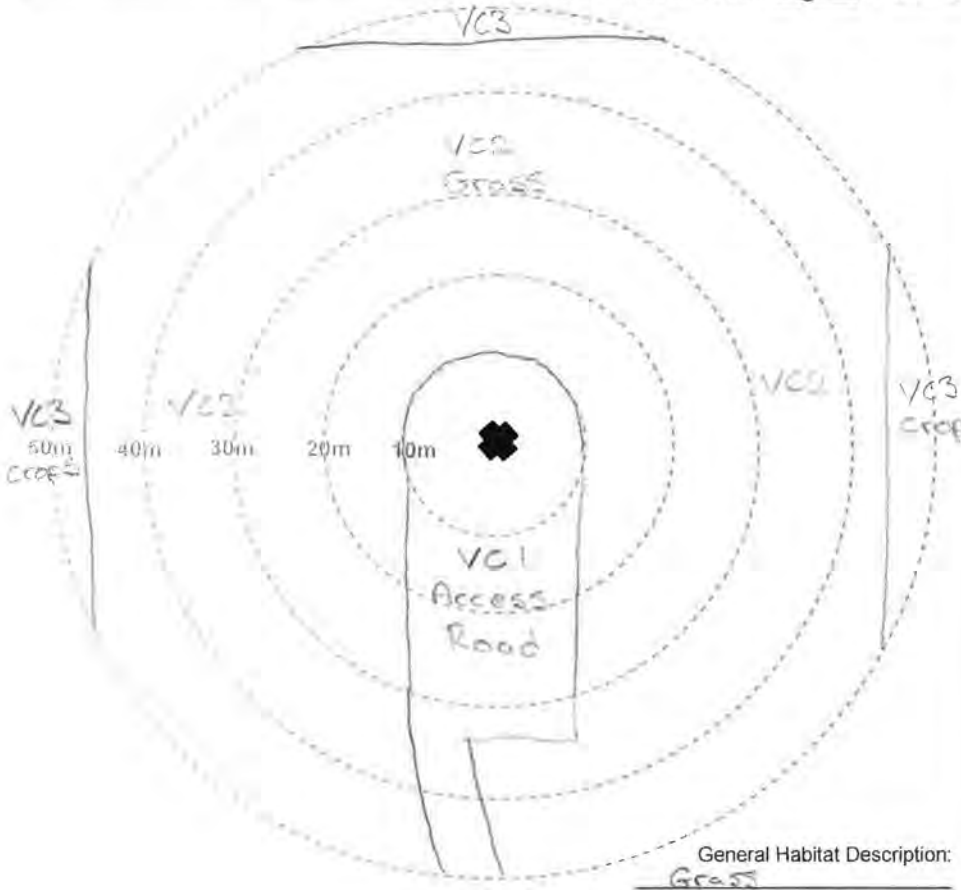
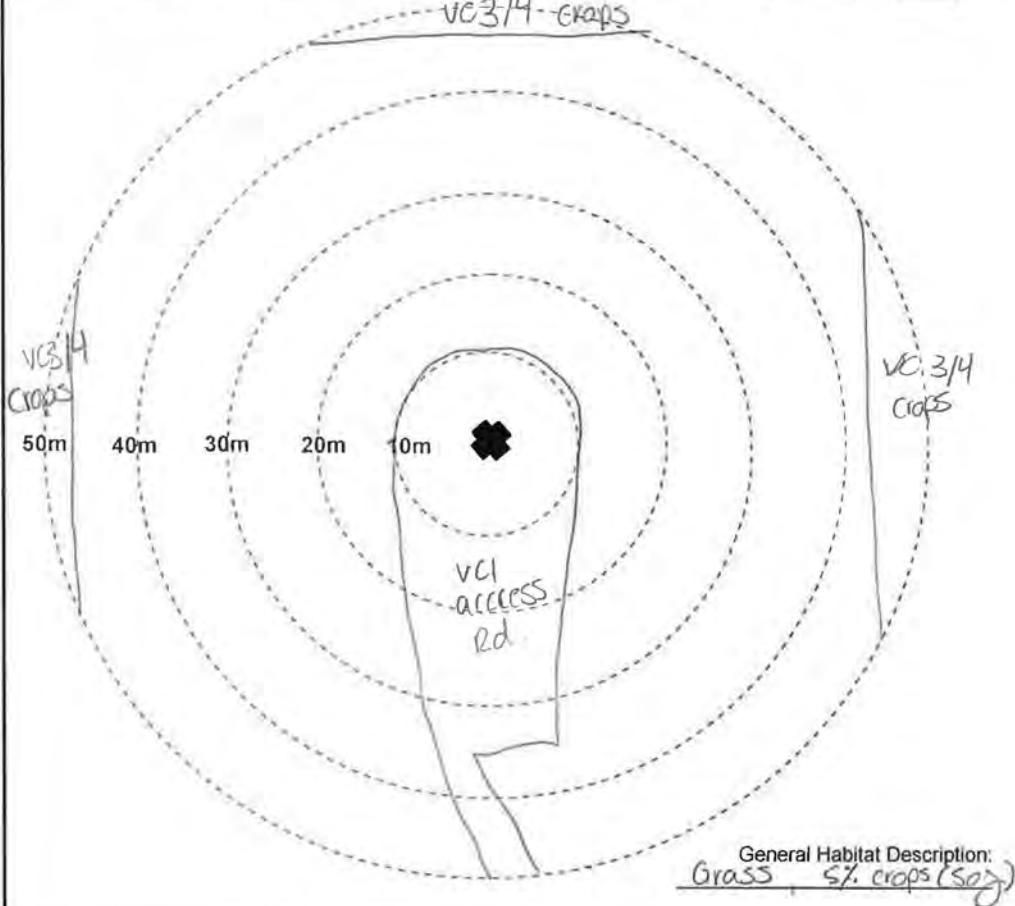


Photo Numbers (from turbine base)  
 Facing North: 101659  
 Facing East: 101708  
 Facing South: 101719  
 Facing West: 101729  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 01/08/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



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

# Visibility Class Map

Project Name: Grand Bard WF Project #: 2408C Turbine #: T16

Photo Numbers (from turbine base)  
 Facing North: 102647  
 Facing East: 102655  
 Facing South: 102703  
 Facing West: 102713  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 01/09/22

Observer: KLB, MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N

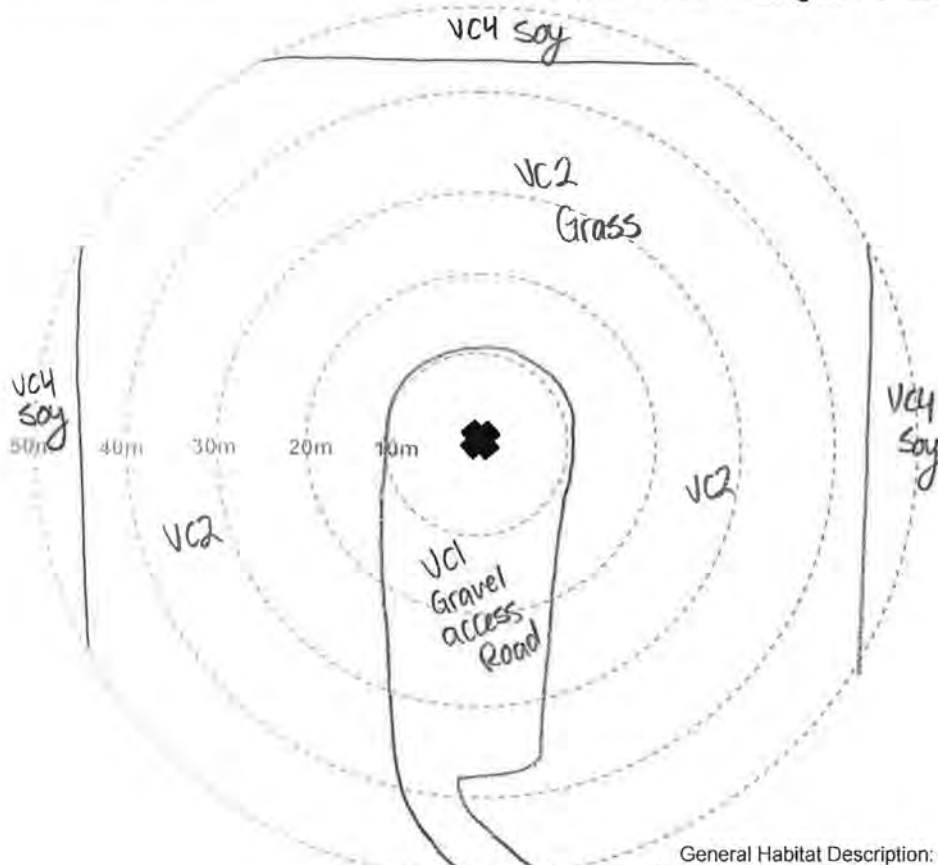
Photo Numbers (from turbine base)  
 Facing North: 101327  
 Facing East: 101335  
 Facing South: 101345  
 Facing West: 101354  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/22

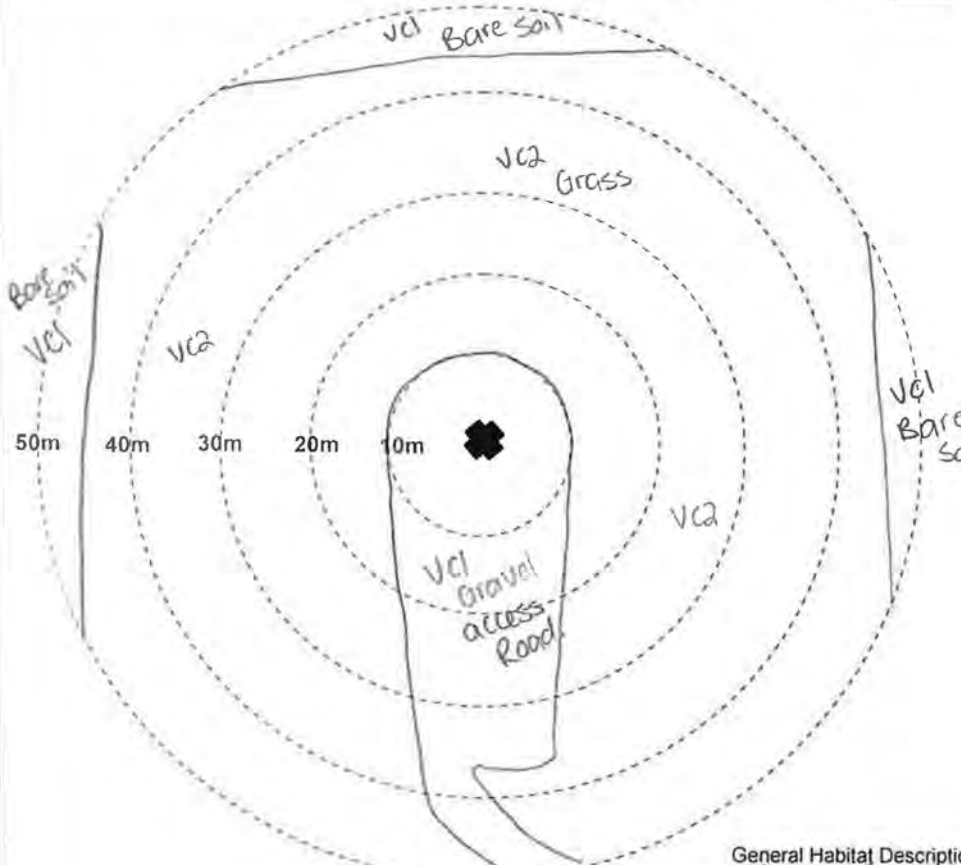
Observer: YLB, MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



General Habitat Description:  
85% Grass, 5% soy



General Habitat Description:  
Grass / Bare Soil

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: Grand Bend WF Project #: 2408c Turbine #: T17 Degree of Slope ✓ degrees Slope Orientation ✓ (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 5474  
 Facing East: 3120  
 Facing South: 1905  
 Facing West: 0571  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/05/22

Observer: MGB, KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N

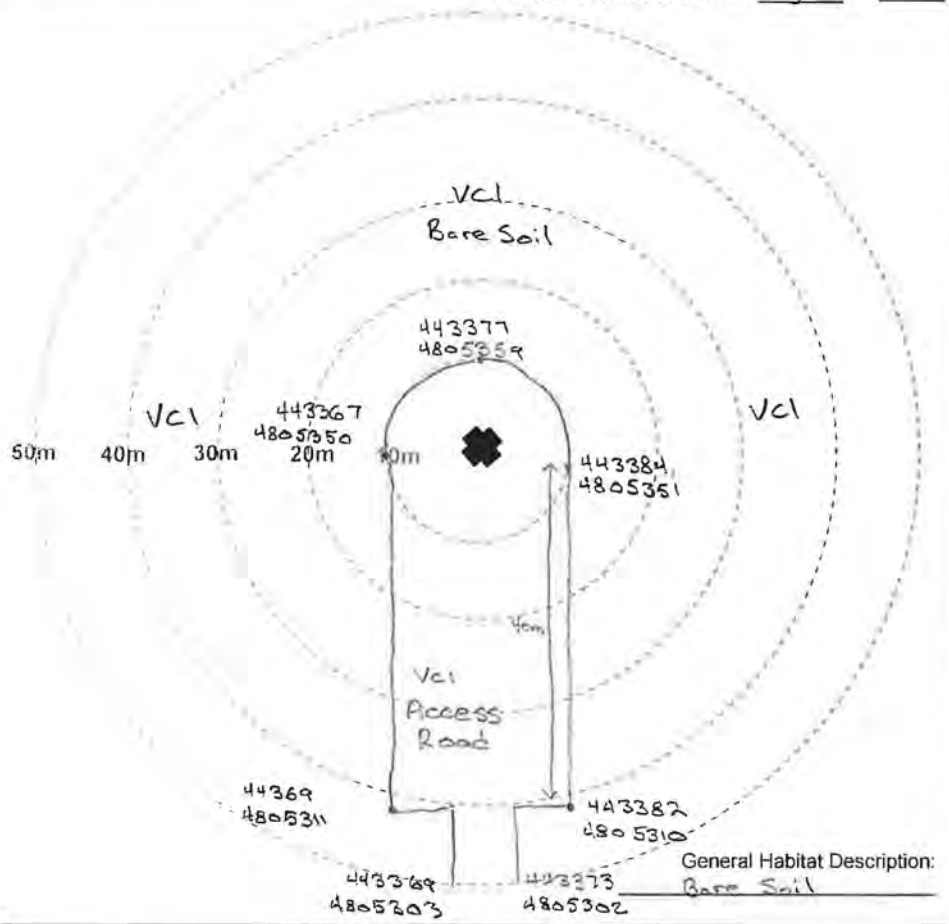


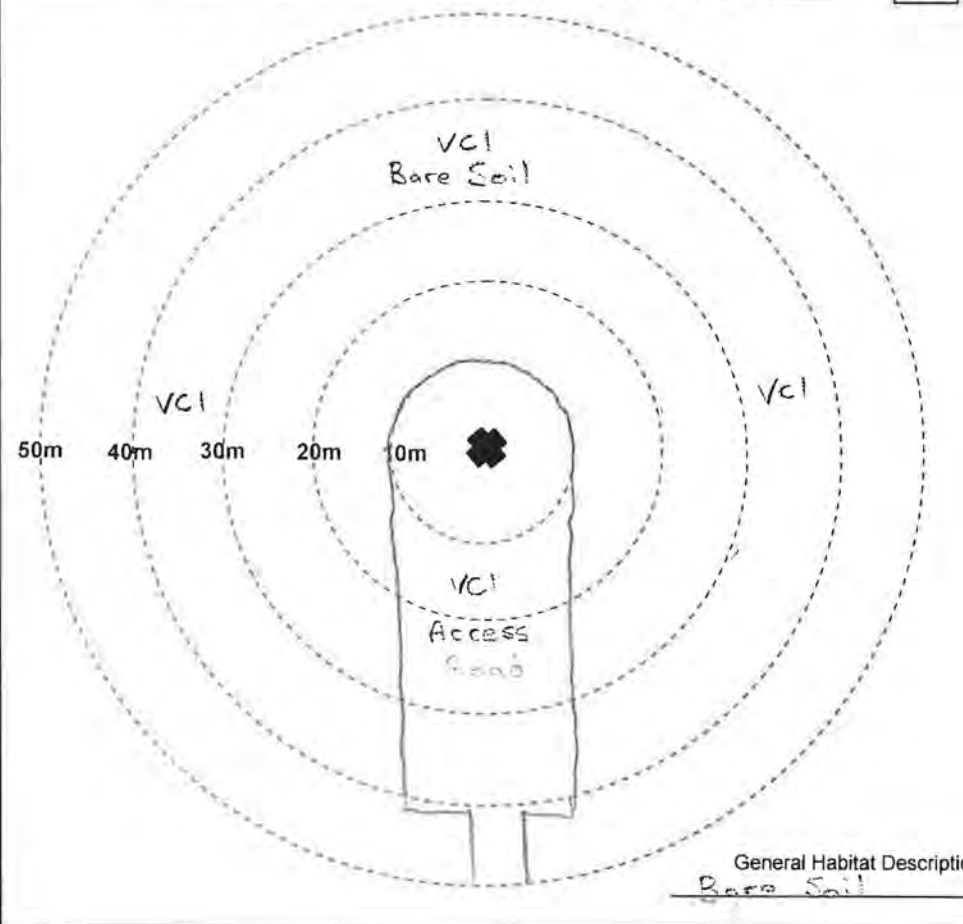
Photo Numbers (from turbine base)  
 Facing North: 8776  
 Facing East: 8865  
 Facing South: 9025  
 Facing West: 9498  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/06/22

Observer: MGB, KLR

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



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

# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408c Turbine #: T7

Photo Numbers (from turbine base)  
 Facing North: 2068  
 Facing East: 2069  
 Facing South: 2070  
 Facing West: 2071  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04/07/22  
 Observer: MGR KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m

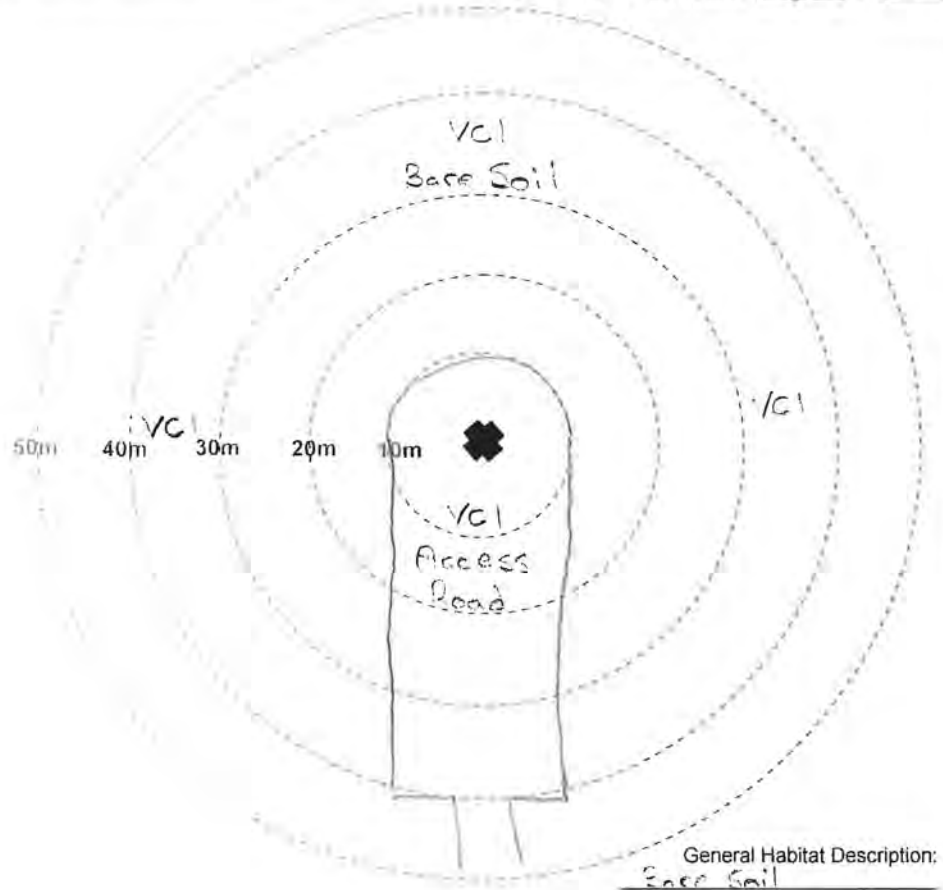
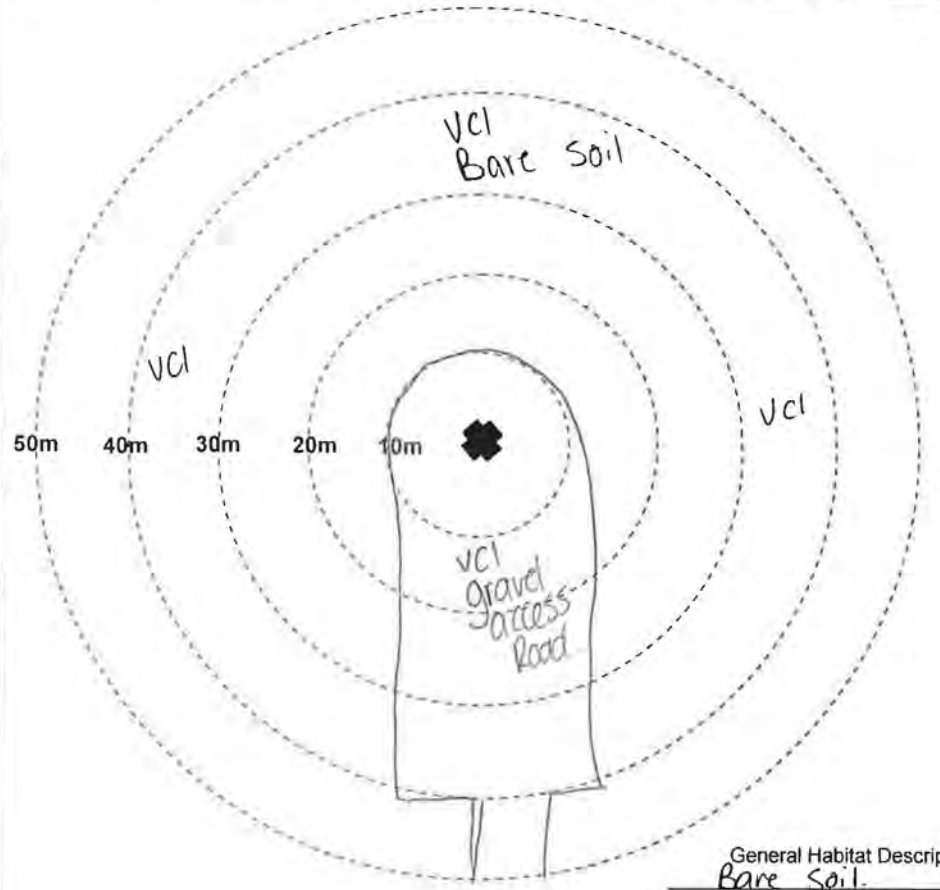


Photo Numbers (from turbine base)  
 Facing North: 121532  
 Facing East: 121541  
 Facing South: 121552  
 Facing West: 121604  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 01/08/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



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



# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408C Turbine #: T17

Photo Numbers (from turbine base)  
 Facing North: 124135  
 Facing East: 124142  
 Facing South: 124151  
 Facing West: 124202  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 01/09/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m

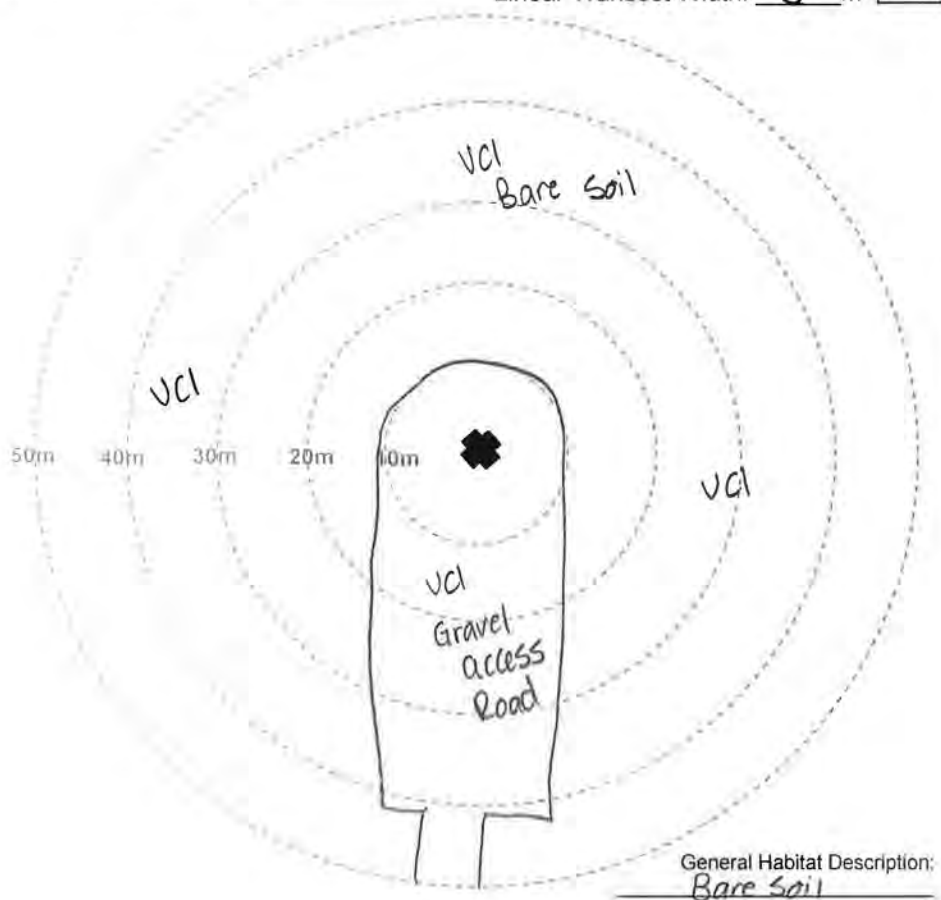
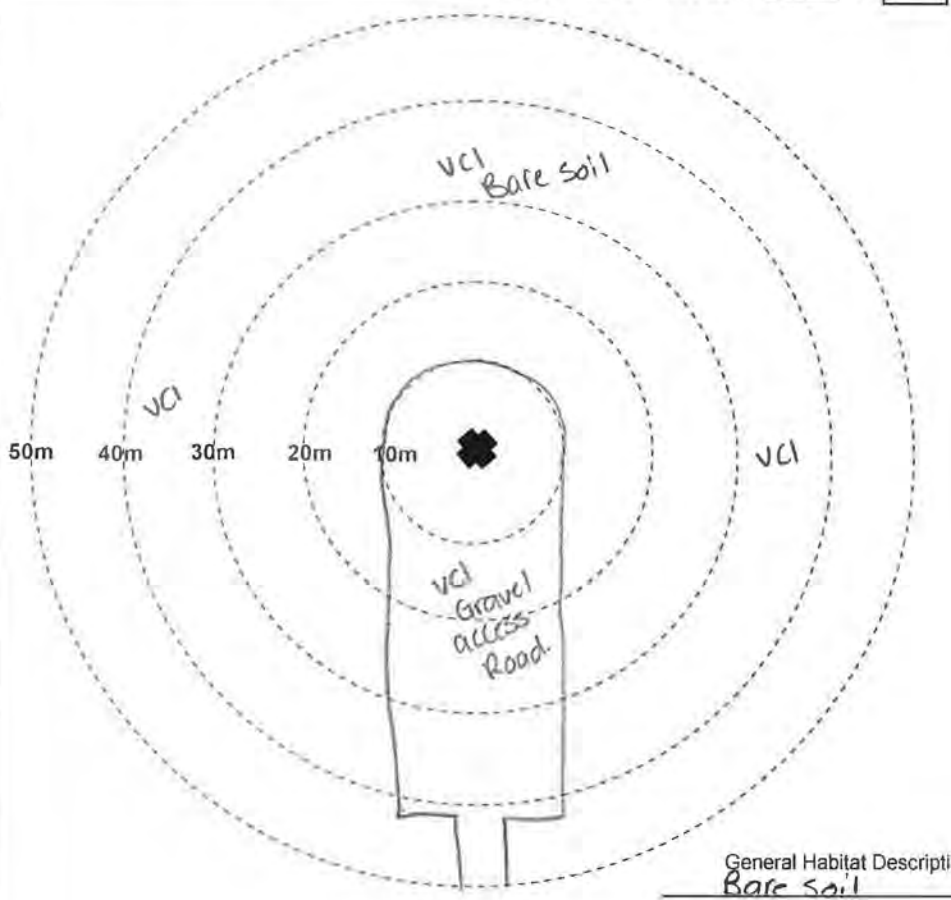


Photo Numbers (from turbine base)  
 Facing North: 114758  
 Facing East: 114811  
 Facing South: 114822  
 Facing West: 114835  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



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

# Visibility Class Map

Project Name: Grand Bend WJF Project #: 2408c Turbine #: T18 Degree of Slope  /  degrees Slope Orientation  /  (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 5558  
 Facing East: 4261  
 Facing South: 3693  
 Facing West: 3015  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/05/22

Observer: MGB, KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m

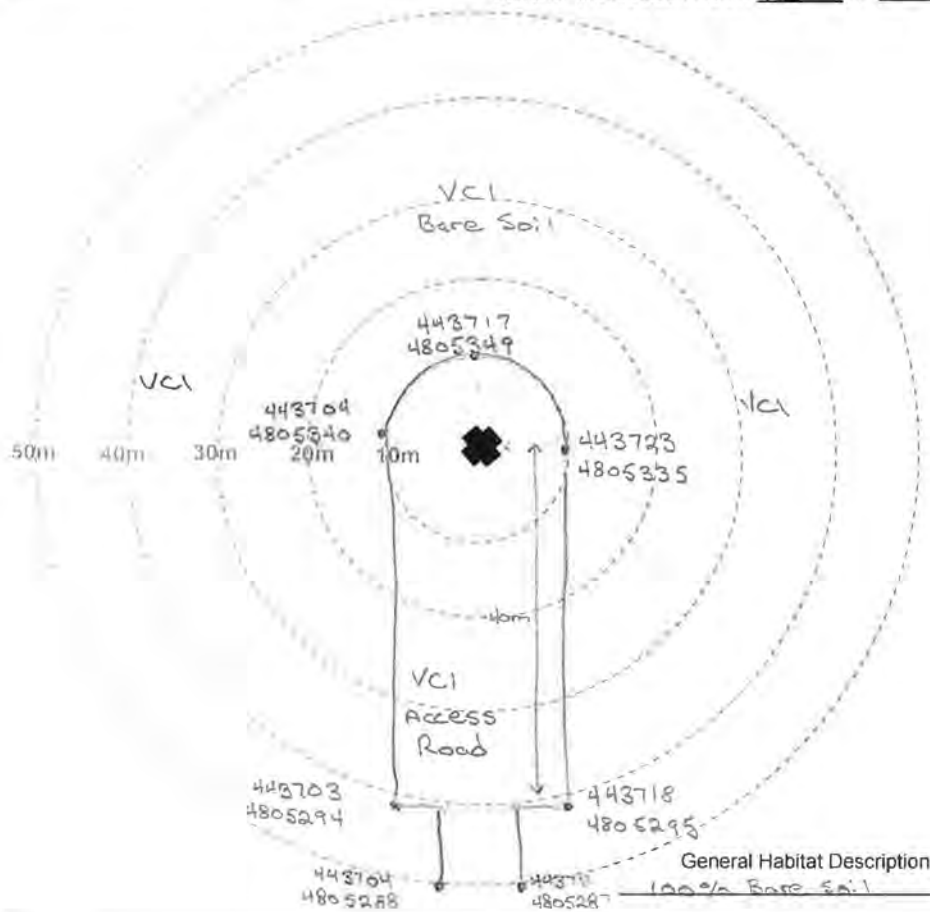
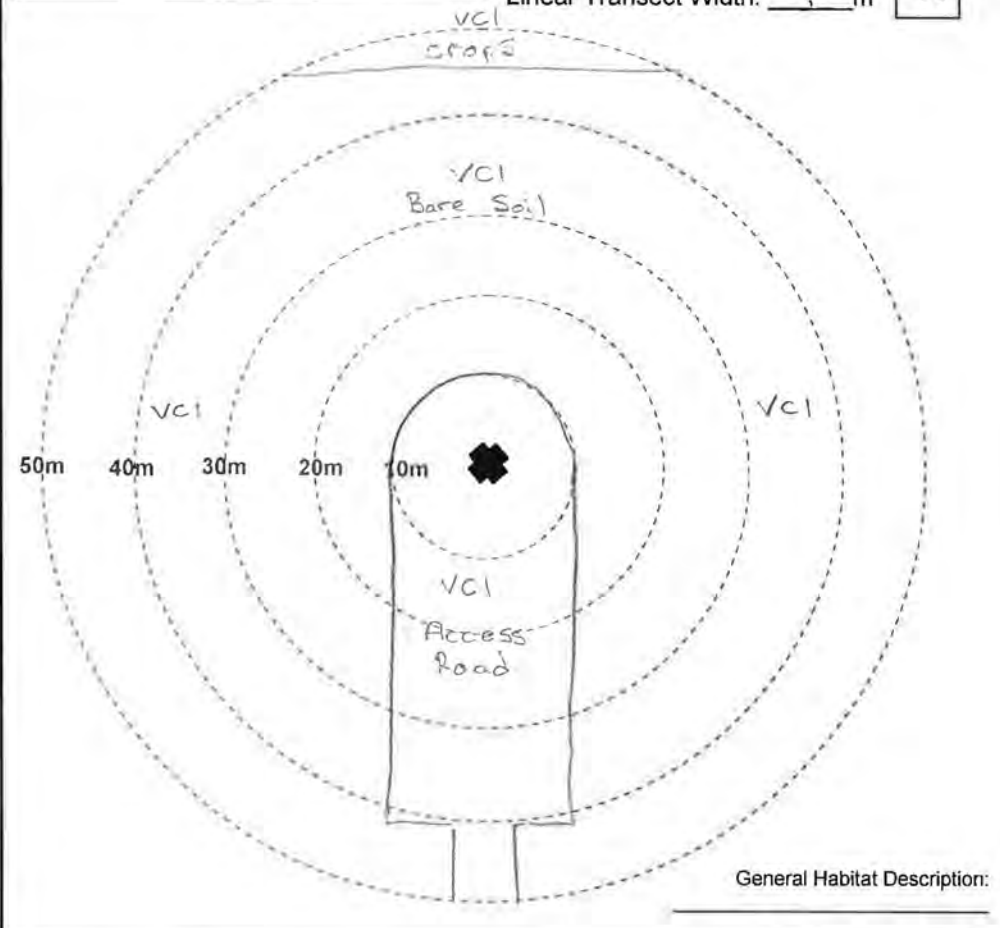


Photo Numbers (from turbine base)  
 Facing North: 5867  
 Facing East: 5909  
 Facing South: 5148  
 Facing West: 4554  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/06/22

Observer: MGB, KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m



## VISIBILITY CLASSES

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

# Visibility Class Map

Project Name: Grand Bend W/F Project #: 2408c Turbine #: 118

Photo Numbers (from turbine base)  
 Facing North: 1227  
 Facing East: 0948  
 Facing South: 1088  
 Facing West: 1026  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 01/07/22

Observer: MGB, KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N

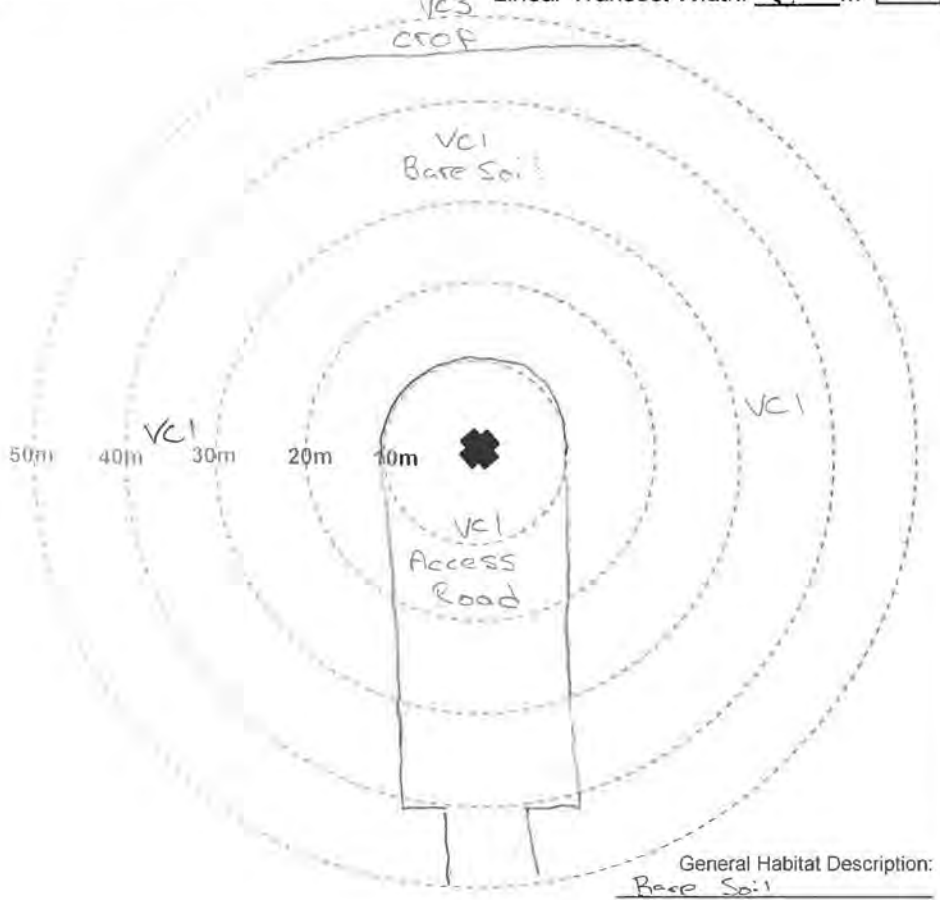


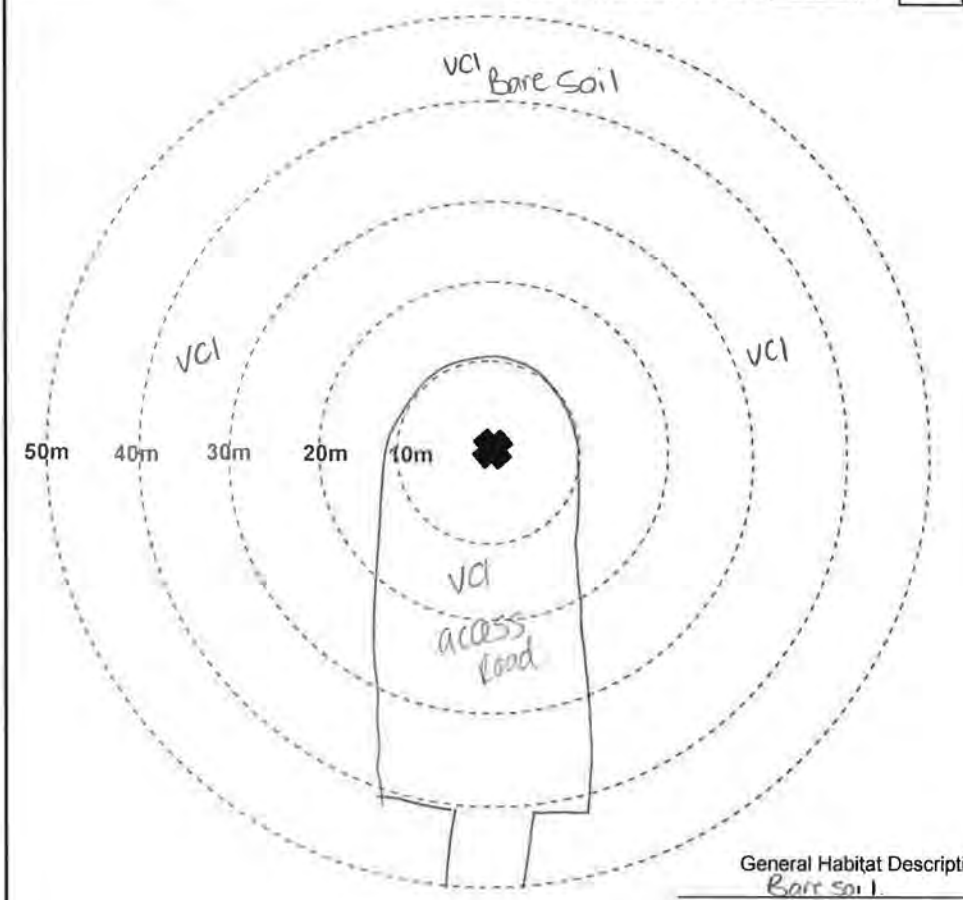
Photo Numbers (from turbine base)  
 Facing North: 113605  
 Facing East: 113613  
 Facing South: 113625  
 Facing West: 113637  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 01/08/22

Observer: MGB, KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



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

# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408C Turbine #: T18

Photo Numbers (from turbine base)  
 Facing North: 120034  
 Facing East: 120043  
 Facing South: 120052  
 Facing West: 120103  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 01/09/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m

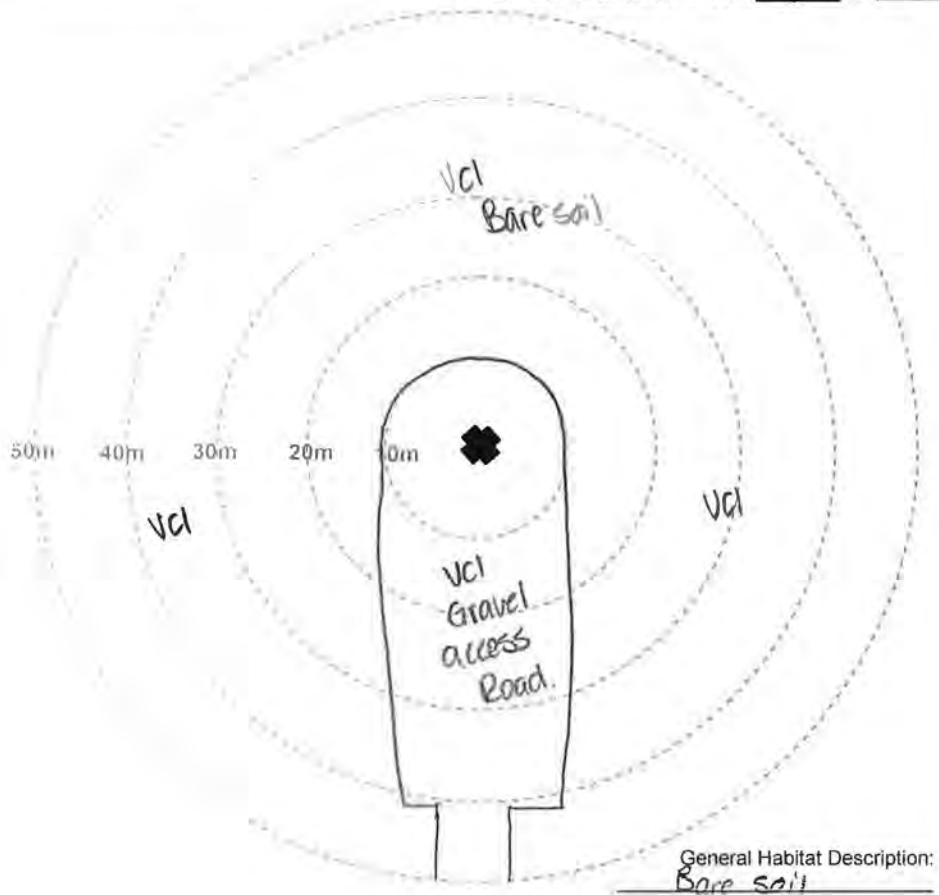
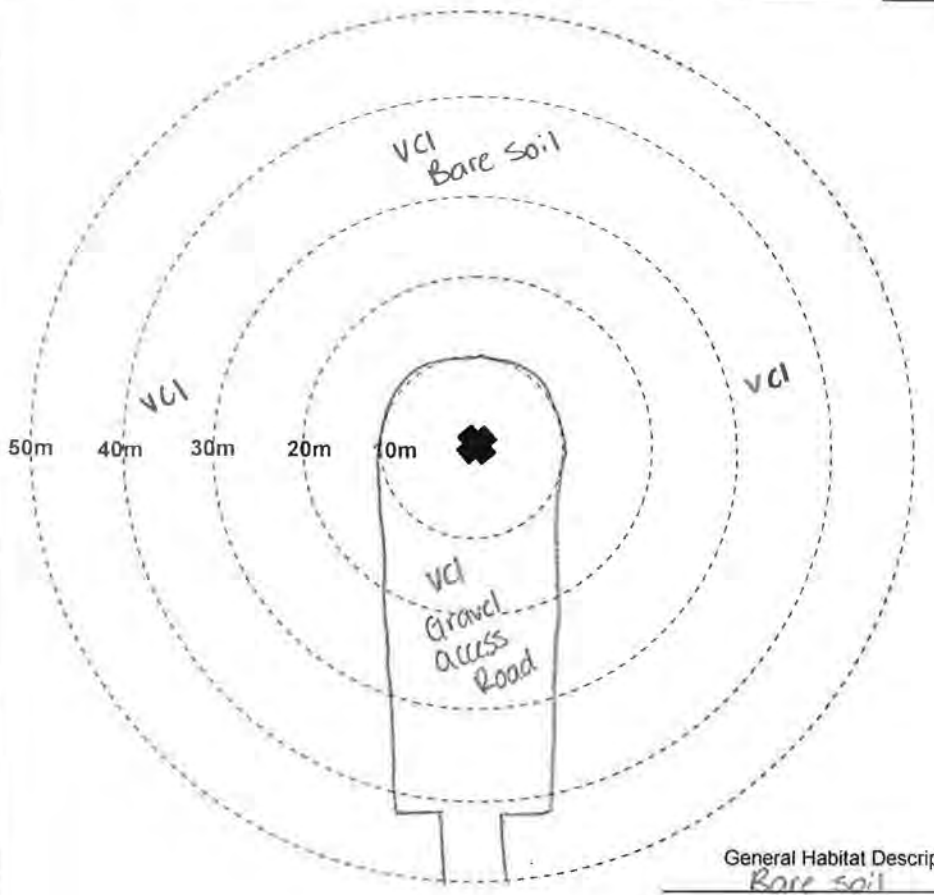


Photo Numbers (from turbine base)  
 Facing North: 110550  
 Facing East: 110602  
 Facing South: 110612  
 Facing West: 110622  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



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



# Visibility Class Map

Project Name: Grand Bend Project #: 2408c Turbine #: T20 Degree of Slope      degrees Slope Orientation      (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 7638  
 Facing East: 6513  
 Facing South: 4414  
 Facing West: 1233  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/05/22

Observer: MGB, KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N

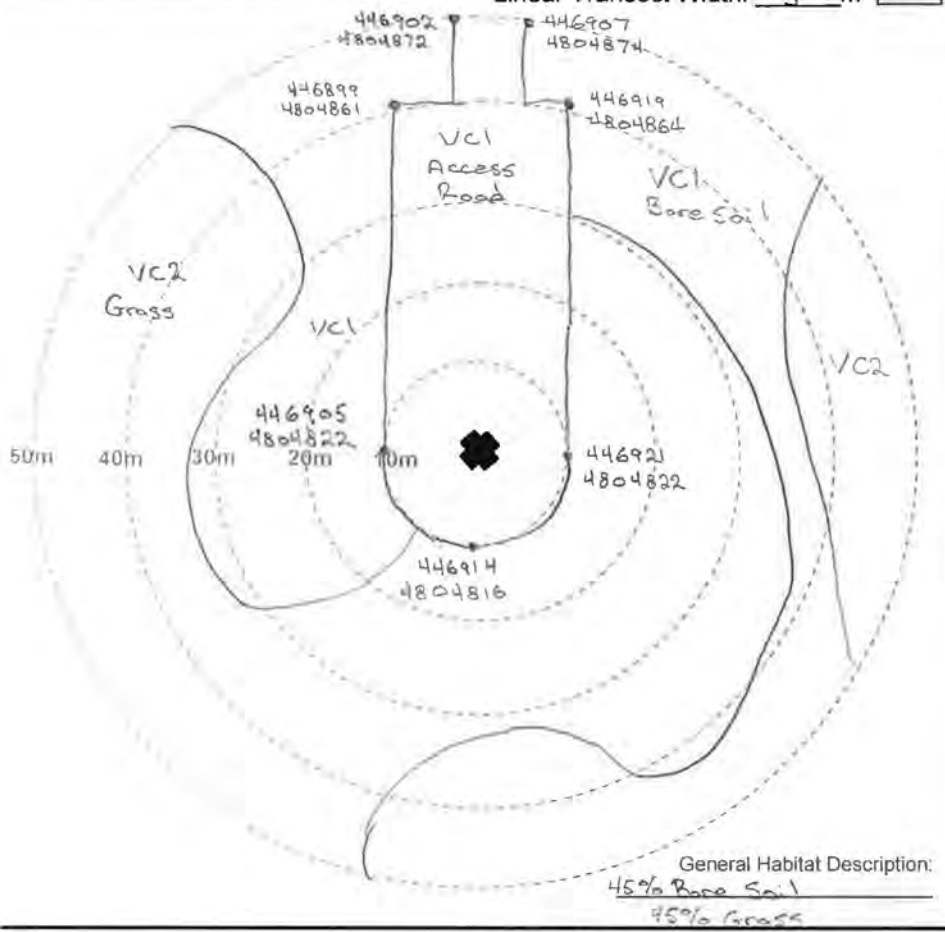


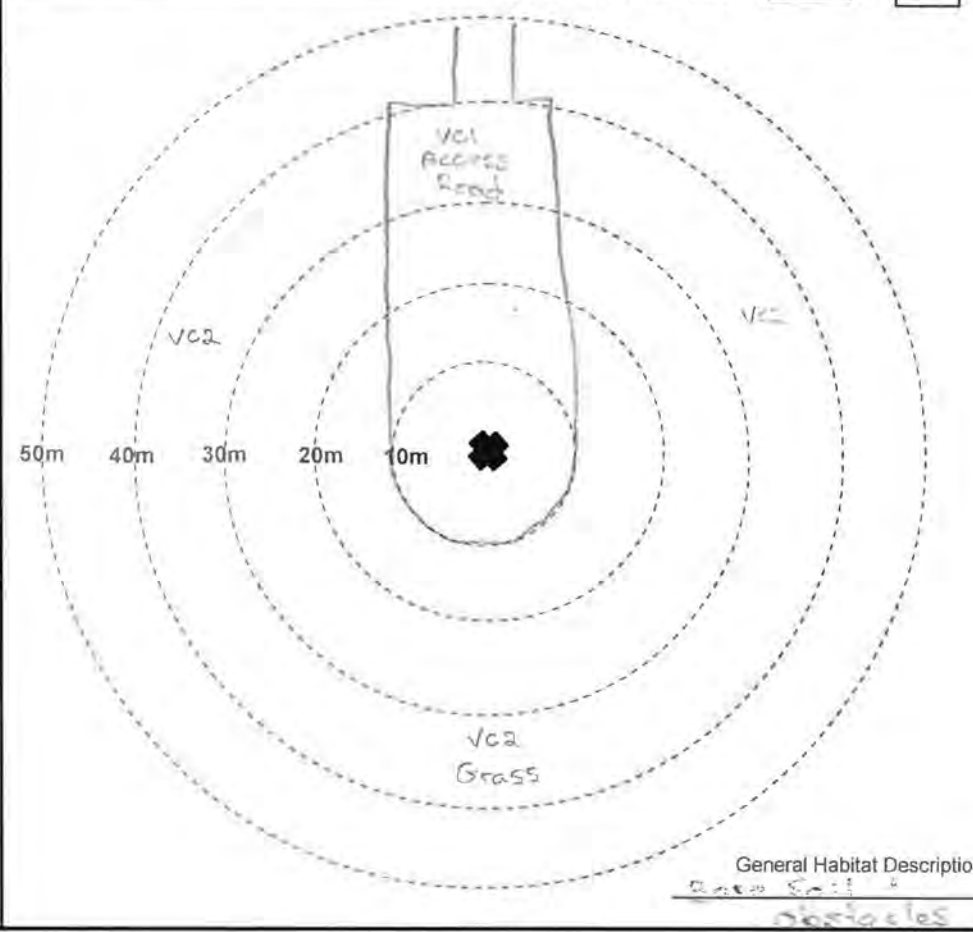
Photo Numbers (from turbine base)  
 Facing North: 3996  
 Facing East: 3255  
 Facing South: 5466  
 Facing West: 5482  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/06/22

Observer: MGB, KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



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

# Visibility Class Map

Project Name: Grand Bend WE Project #: 2408C Turbine #: T20

Photo Numbers (from turbine base)  
 Facing North: 4397  
 Facing East: 4521  
 Facing South: 8916  
 Facing West: 7182  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04/07/22  
 Observer: MGB, KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m

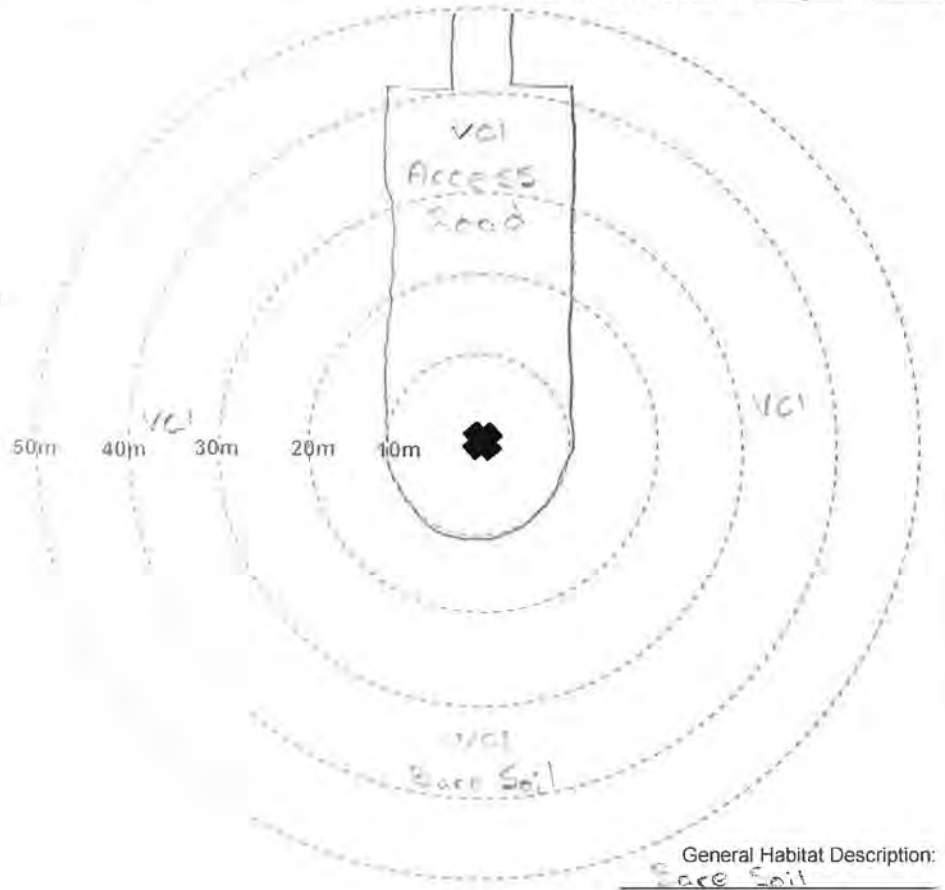
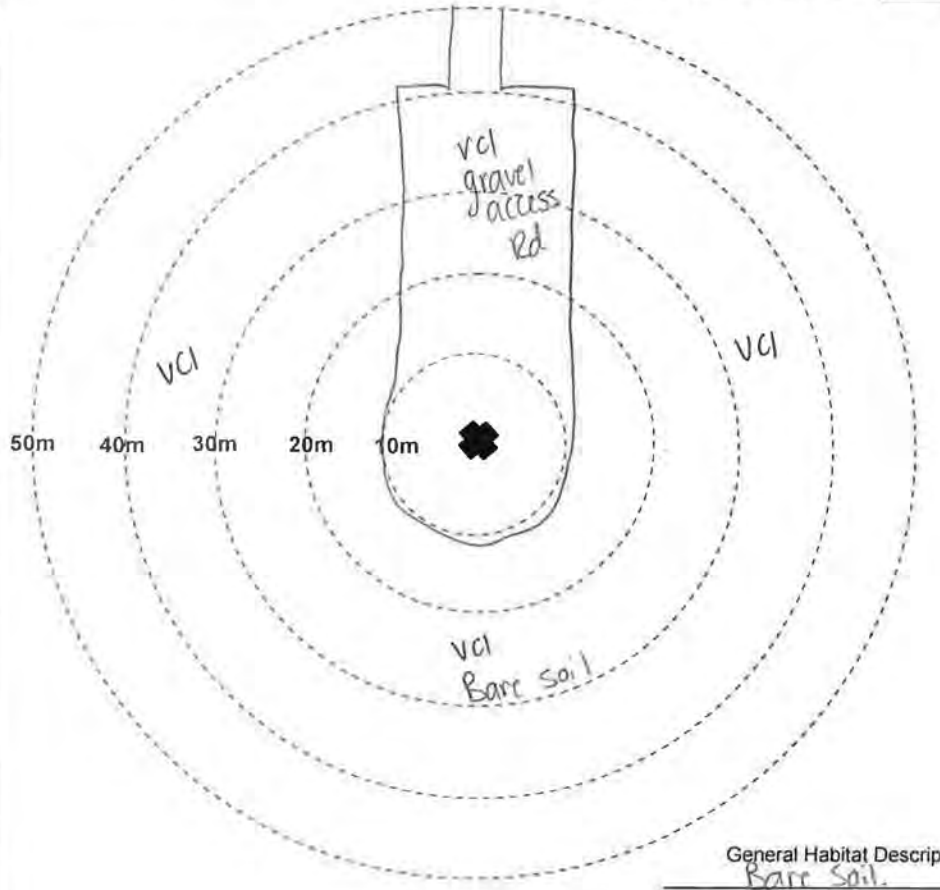


Photo Numbers (from turbine base)  
 Facing North: 132402  
 Facing East: 132415  
 Facing South: 132428  
 Facing West: 132440  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 01/08/22  
 Observer: MGB, KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



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

# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408C Turbine #: T20

Photo Numbers (from turbine base)  
 Facing North: 134405  
 Facing East: 134416  
 Facing South: 134428  
 Facing West: 134440  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 01/09/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m

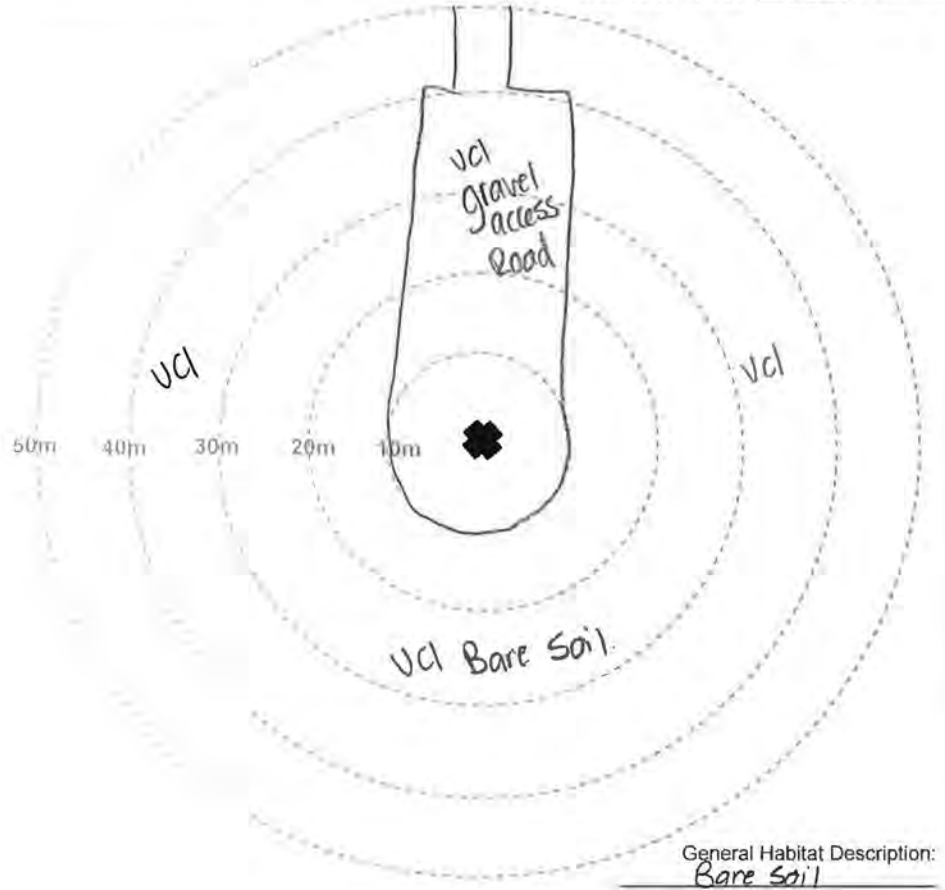
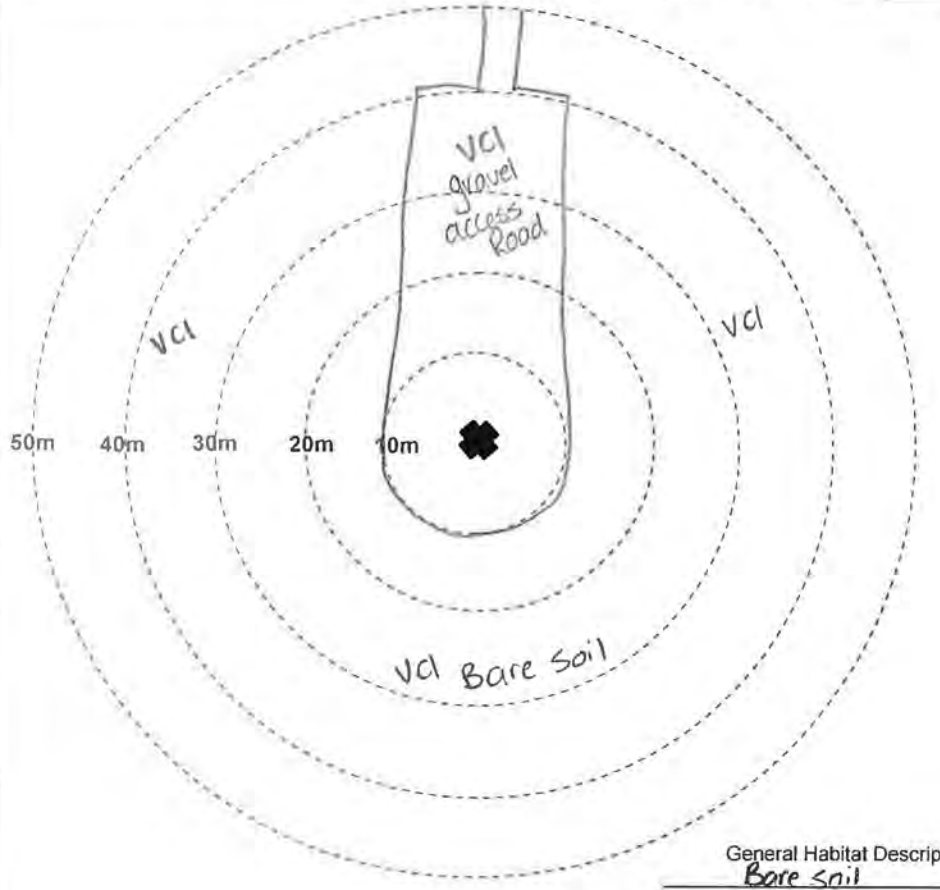


Photo Numbers (from turbine base)  
 Facing North: 125055  
 Facing East: 125107  
 Facing South: 125119  
 Facing West: 125131  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



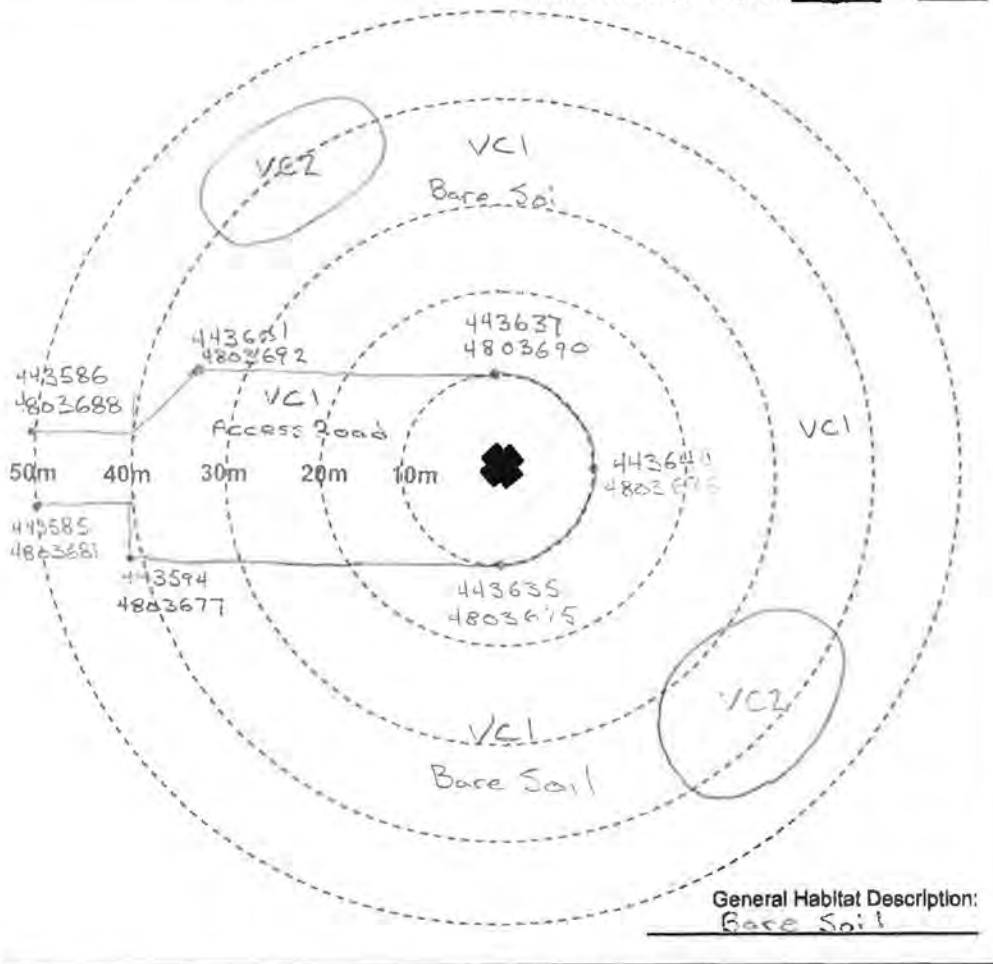
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

# Visibility Class Map

Project Name: Grand Bend LWF Project #: 2408C Turbine #: T27 Degree of Slope  /  degrees Slope Orientation  /  (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 1913  
 Facing East: 9561  
 Facing South: 7893  
 Facing West: 5865  
 (sketch habitat and visibility classes)

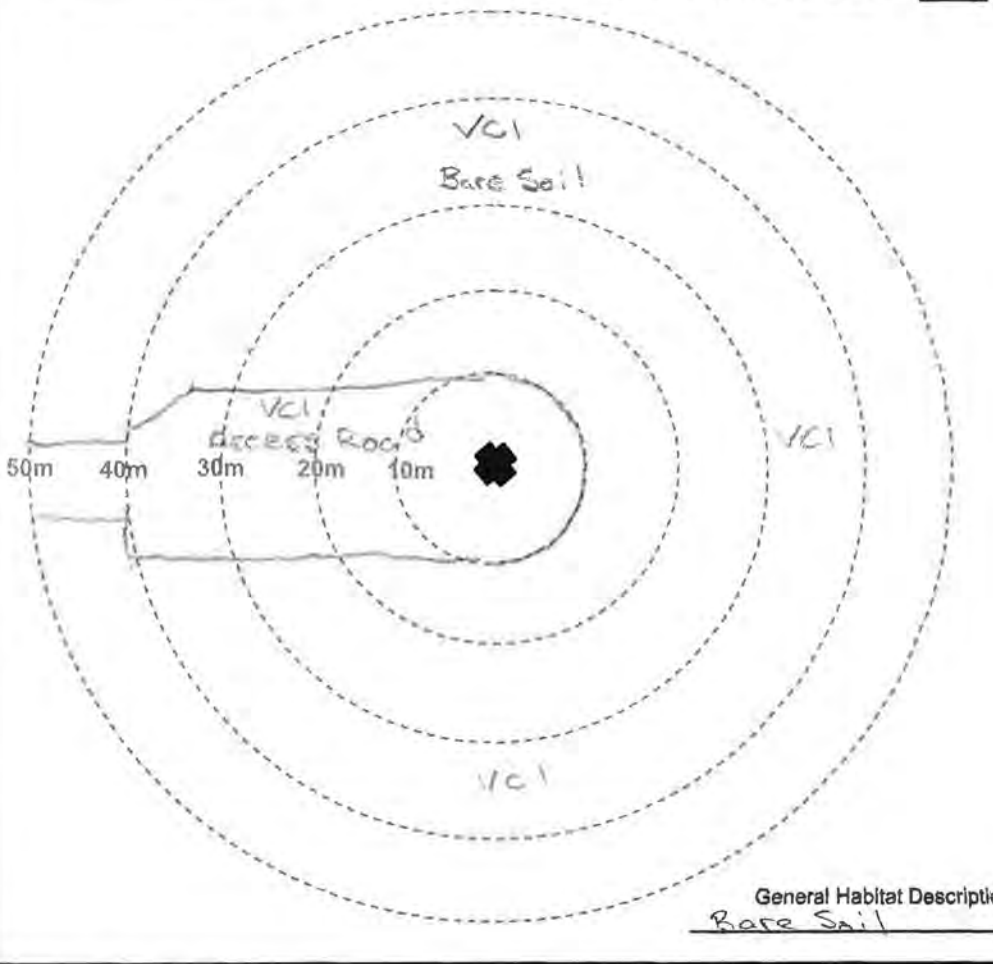
Date (DD/MM/YY): 03/05/22  
 Observer: MGB, KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



General Habitat Description:  
Bare Soil

Photo Numbers (from turbine base)  
 Facing North: 9206  
 Facing East: 8610  
 Facing South: 7042  
 Facing West: 6489  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/06/22  
 Observer: MGB, KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



General Habitat Description:  
Bare Soil

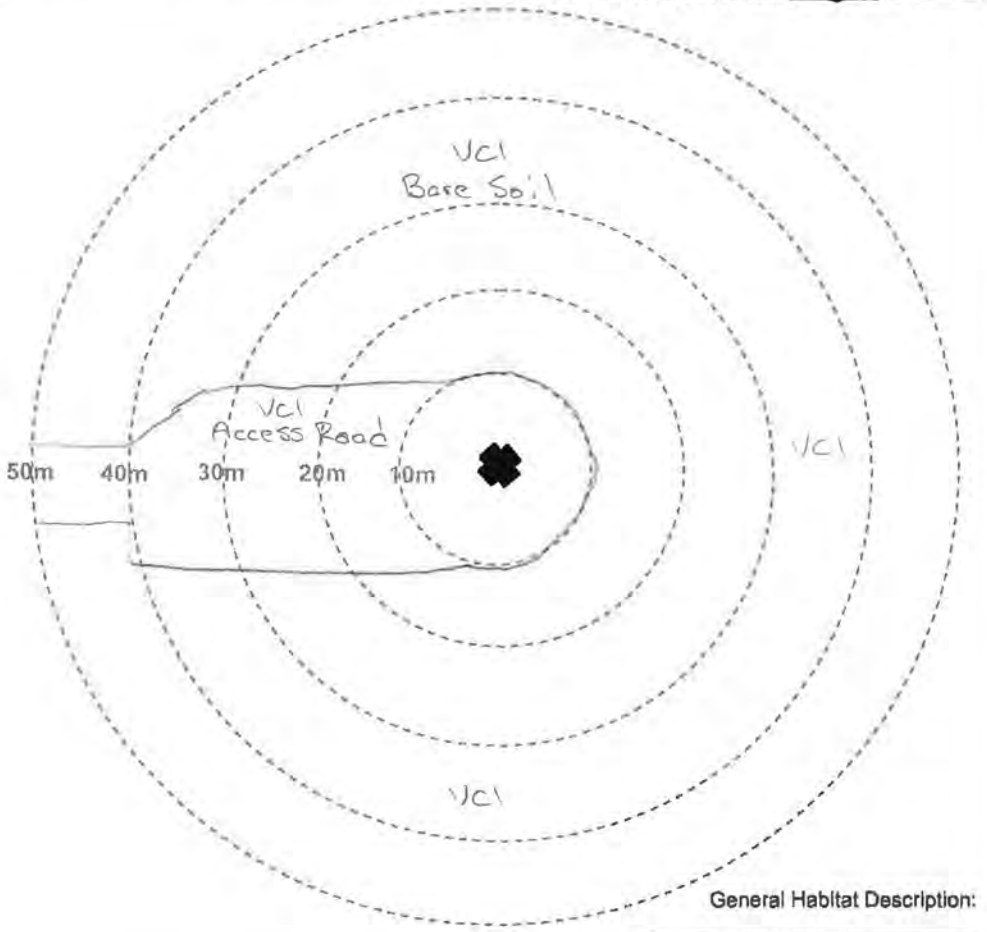
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

# Visibility Class Map

Project Name: Good Road Project #: 24080 Turbine #: T27 Degree of Slope \_\_\_\_\_ degrees Slope Orientation \_\_\_\_\_ (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 2551  
 Facing East: 2557  
 Facing South: 2603  
 Facing West: 2608  
 (sketch habitat and visibility classes)

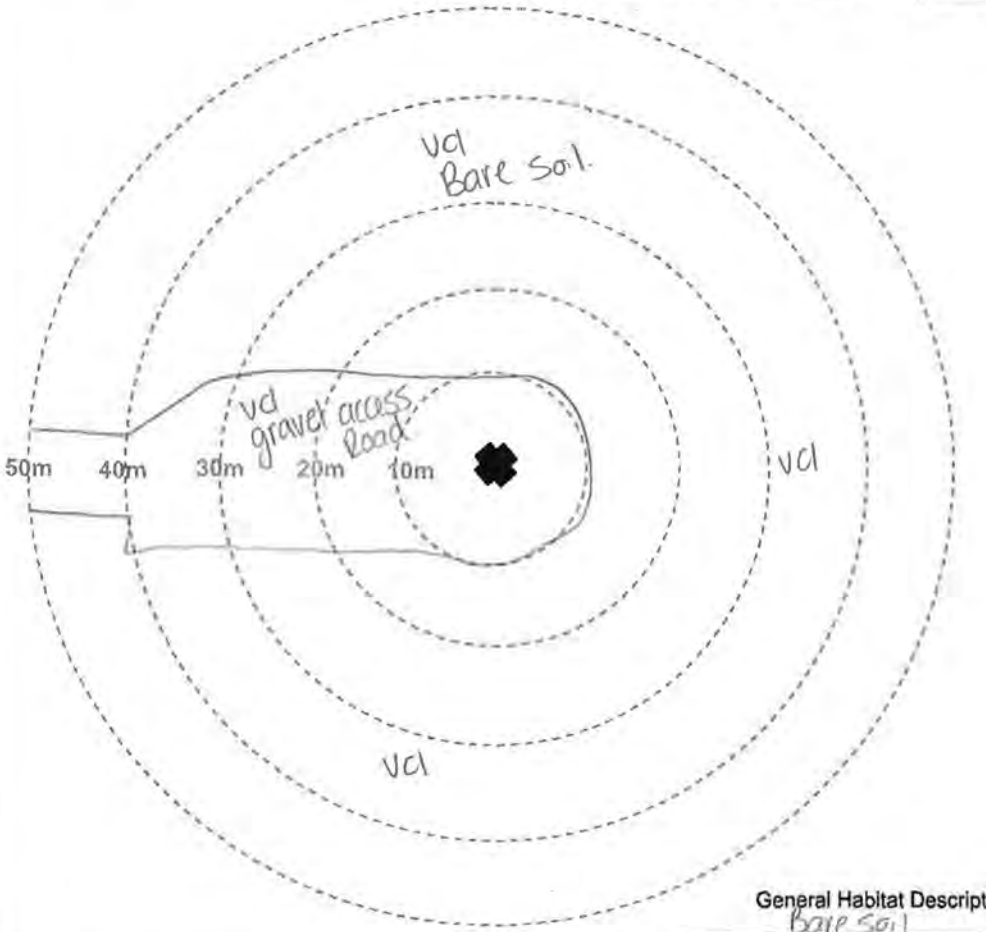
Date (DD/MM/YY): 05/07/22  
 Observer: MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



General Habitat Description:

Photo Numbers (from turbine base)  
 Facing North: 131337  
 Facing East: 131354  
 Facing South: 131408  
 Facing West: 131418  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/08/22  
 Observer: KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



General Habitat Description:  
Bare soil

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: Grand Bend WF Project #: 2408C Turbine #: T27 Degree of Slope      degrees Slope Orientation      (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 123515  
 Facing East: 123526  
 Facing South: 123534  
 Facing West: 123543  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/09/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m

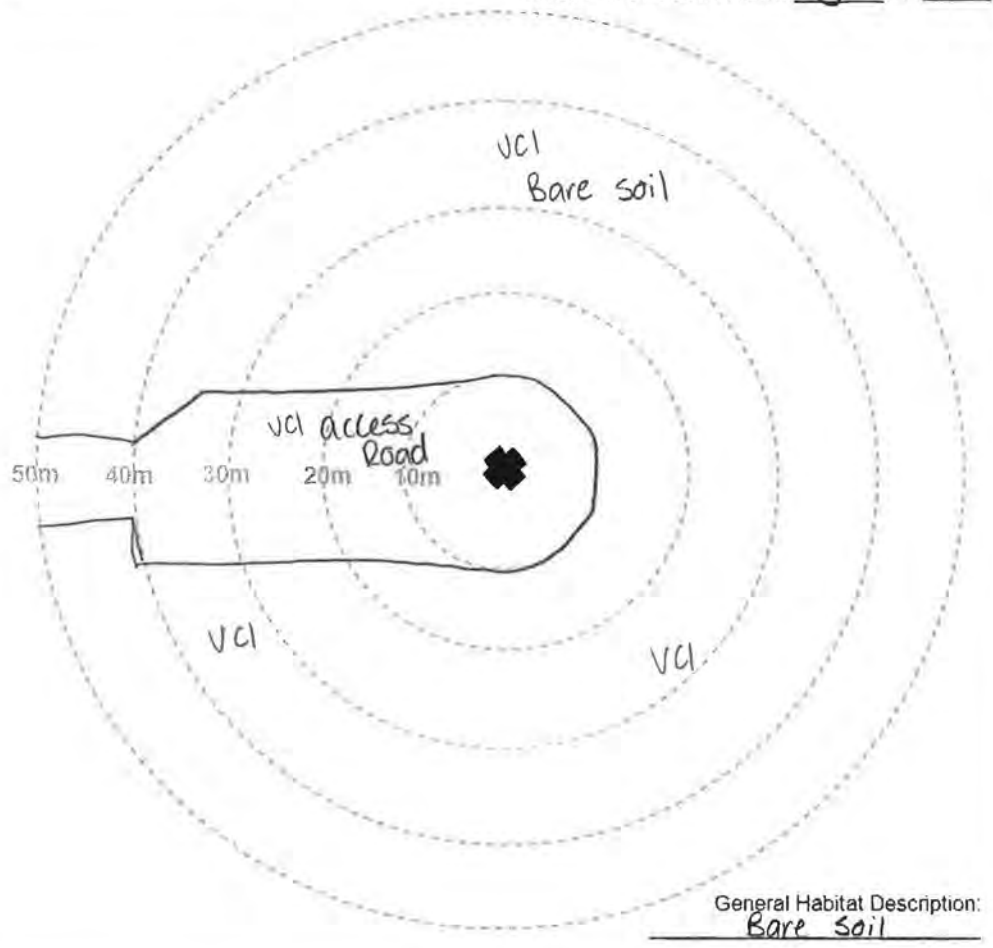
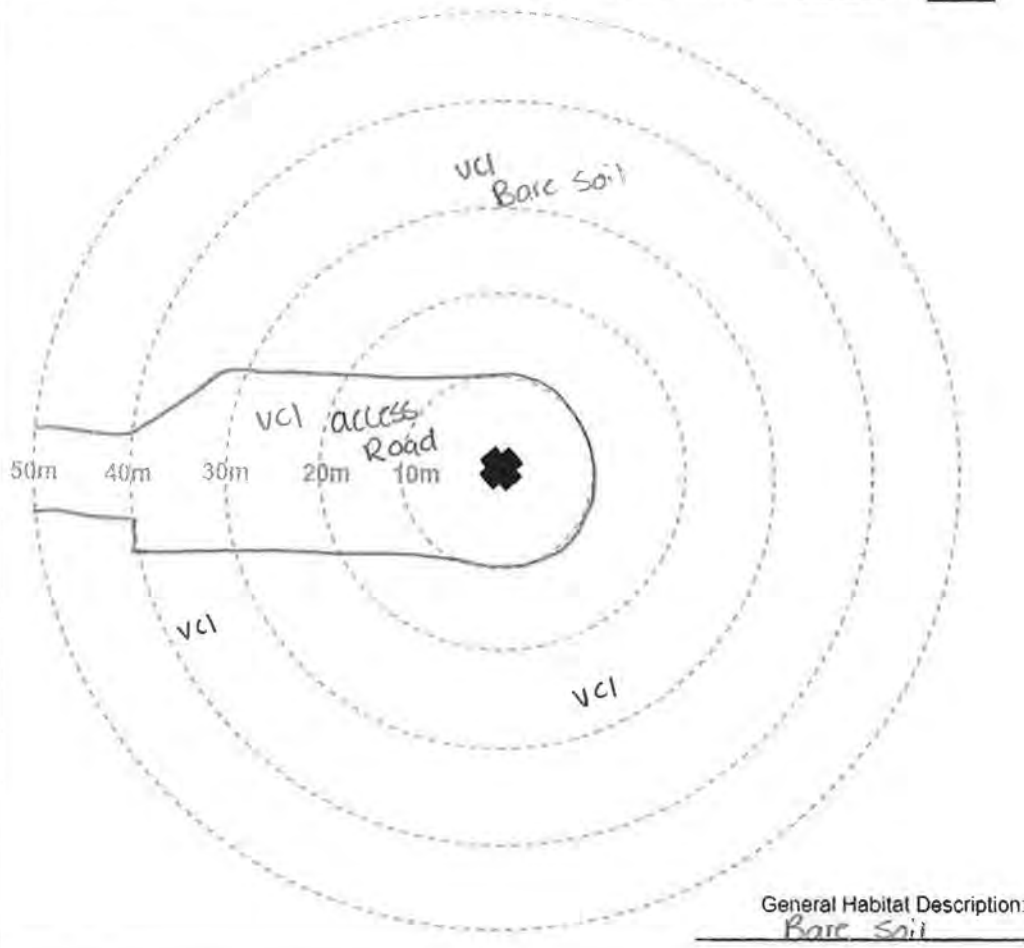


Photo Numbers (from turbine base)  
 Facing North: 131250  
 Facing East: 131304  
 Facing South: 131315  
 Facing West: 131326  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/10/22  
 Observer: KLB, MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



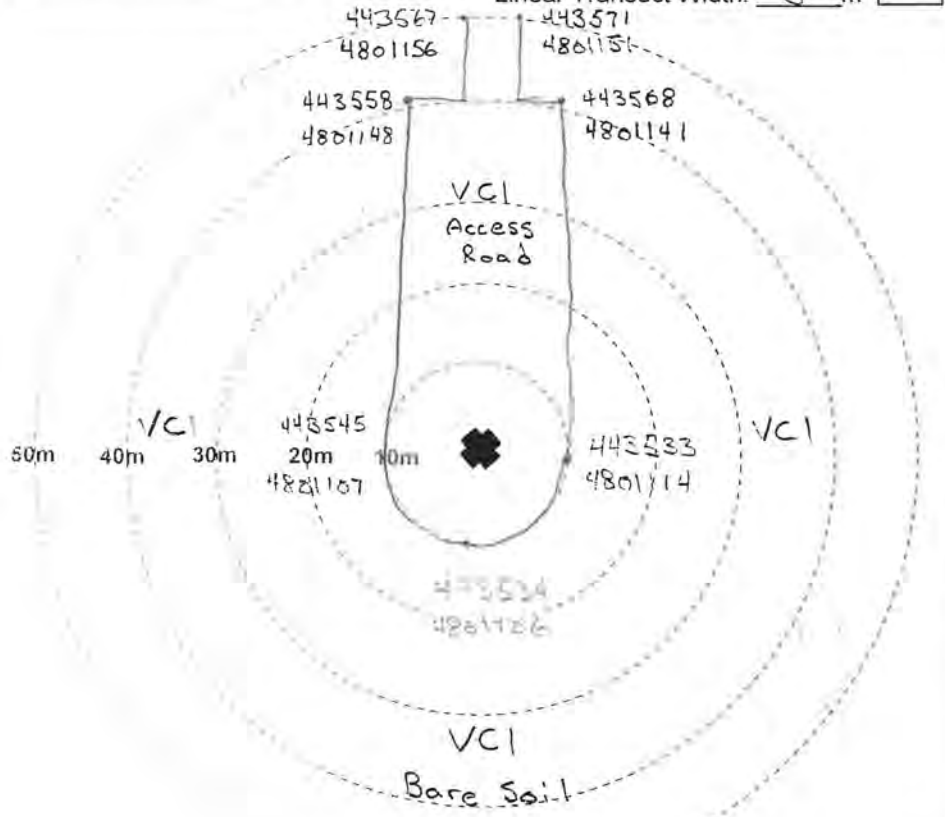
VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 3	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall
Not Searchable	Dense shrubs, woods, or other unsearchable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

# Visibility Class Map

Project Name: Grand Bend WJF Project #: 2408c Turbine #: T31 Degree of Slope      degrees Slope Orientation      (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 6600  
 Facing East: 4842  
 Facing South: 3762  
 Facing West: 1882  
 (sketch habitat and visibility classes)

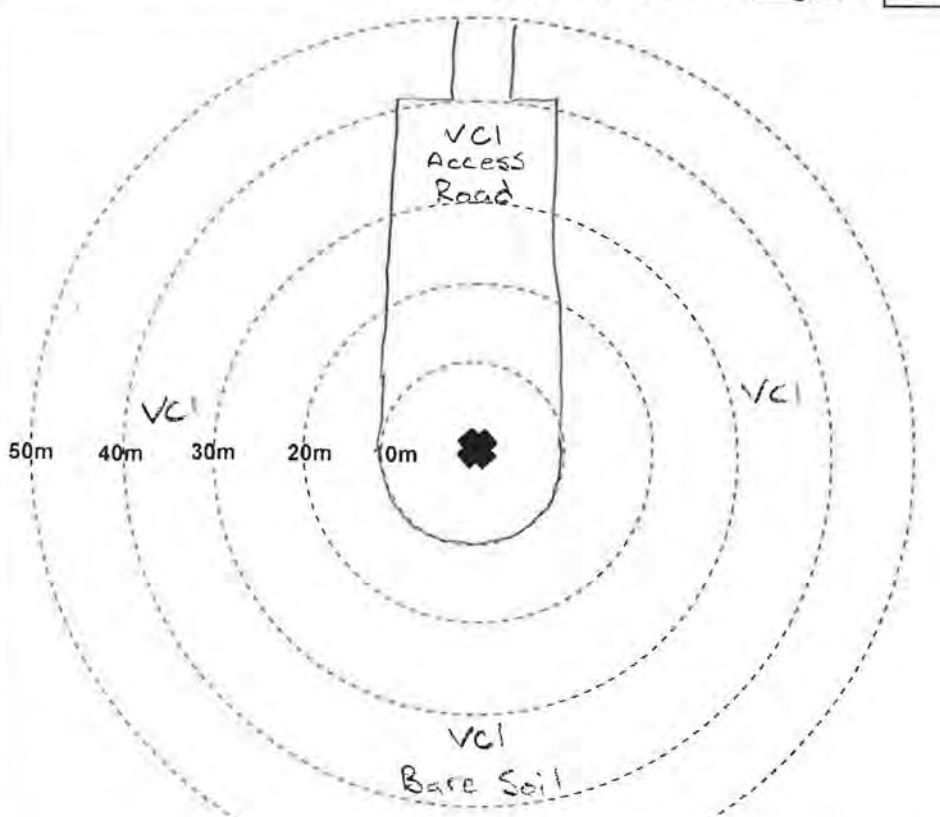
Date (DD/MM/YY): 02/05/22  
 Observer: MGB, KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



General Habitat Description:  
Bare Soil

Photo Numbers (from turbine base)  
 Facing North: 9774  
 Facing East: 1210  
 Facing South: 0245  
 Facing West: 9186  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/06/22  
 Observer: MGB, KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



General Habitat Description:  
Bare Soil

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: Grand Bend Project #: 24680 Turbine #: 731

Photo Numbers (from turbine base)  
 Facing North: 123239  
 Facing East: 123249  
 Facing South: 123115  
 Facing West: 123102  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 05/07/22

Observer: MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N

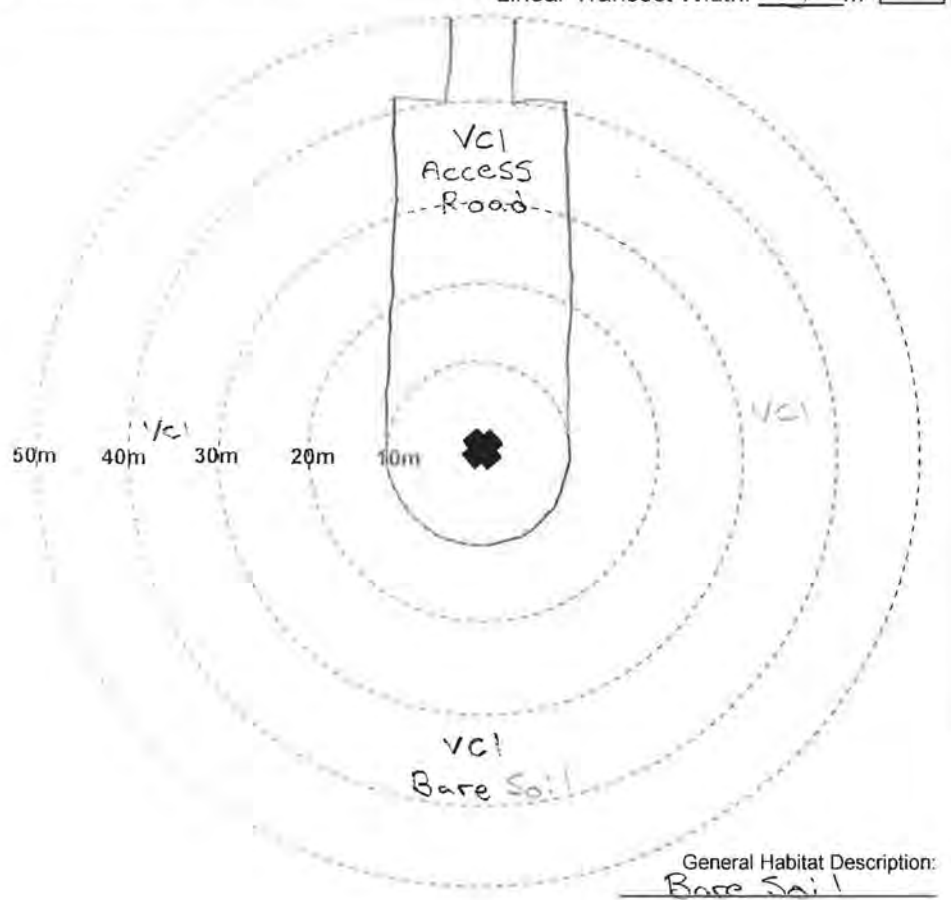


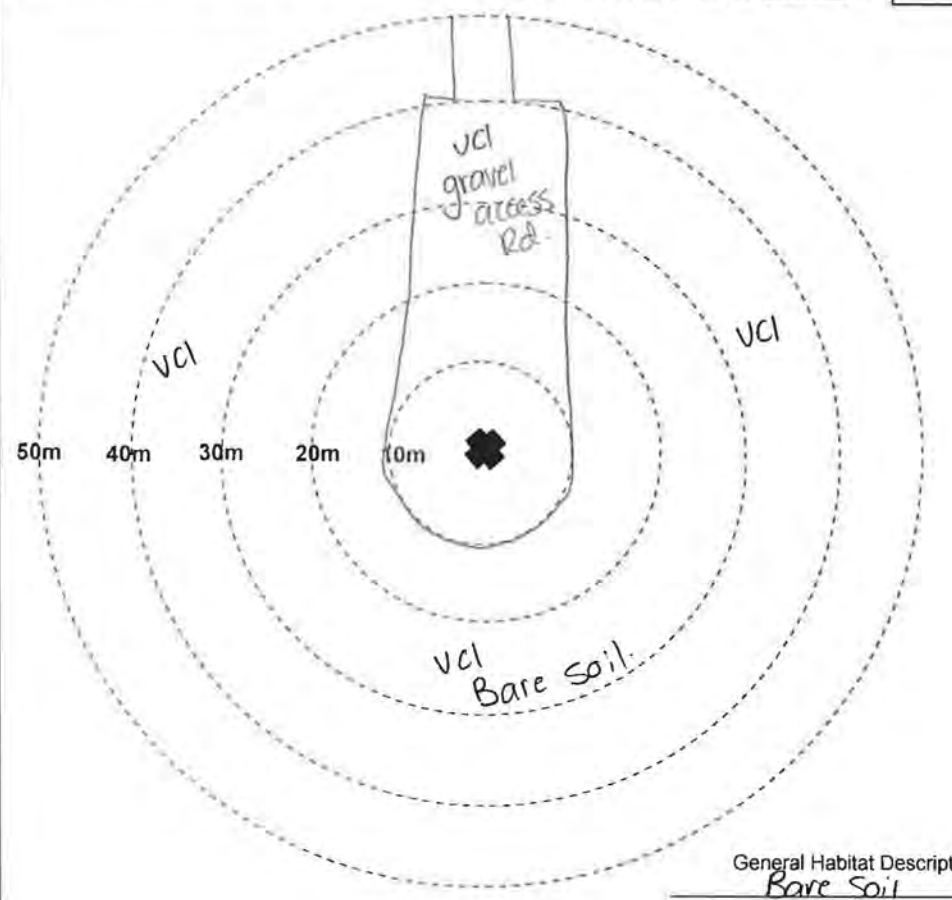
Photo Numbers (from turbine base)  
 Facing North: 122231  
 Facing East: 122242  
 Facing South: 122256  
 Facing West: 122311  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/08/22

Observer: KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



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



# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408C Turbine #: T31

Photo Numbers (from turbine base)  
 Facing North: 114 735  
 Facing East: 114 747  
 Facing South: 114 801  
 Facing West: 114 816  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/09/22

Observer: KLB, MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N

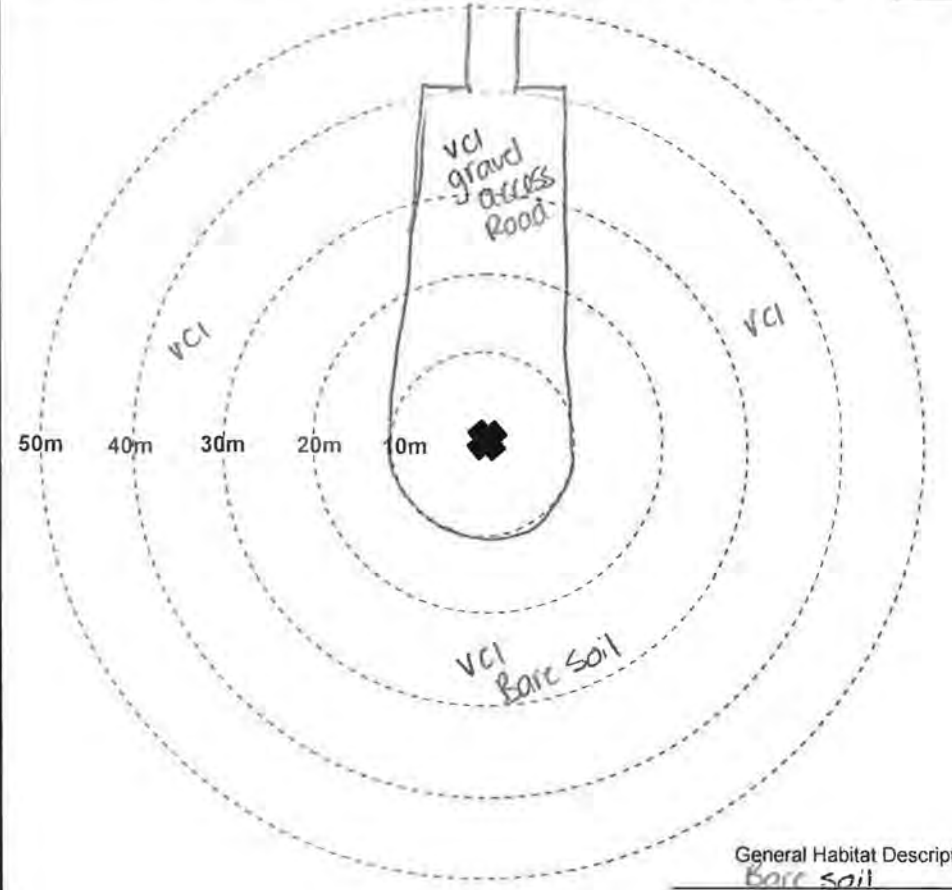
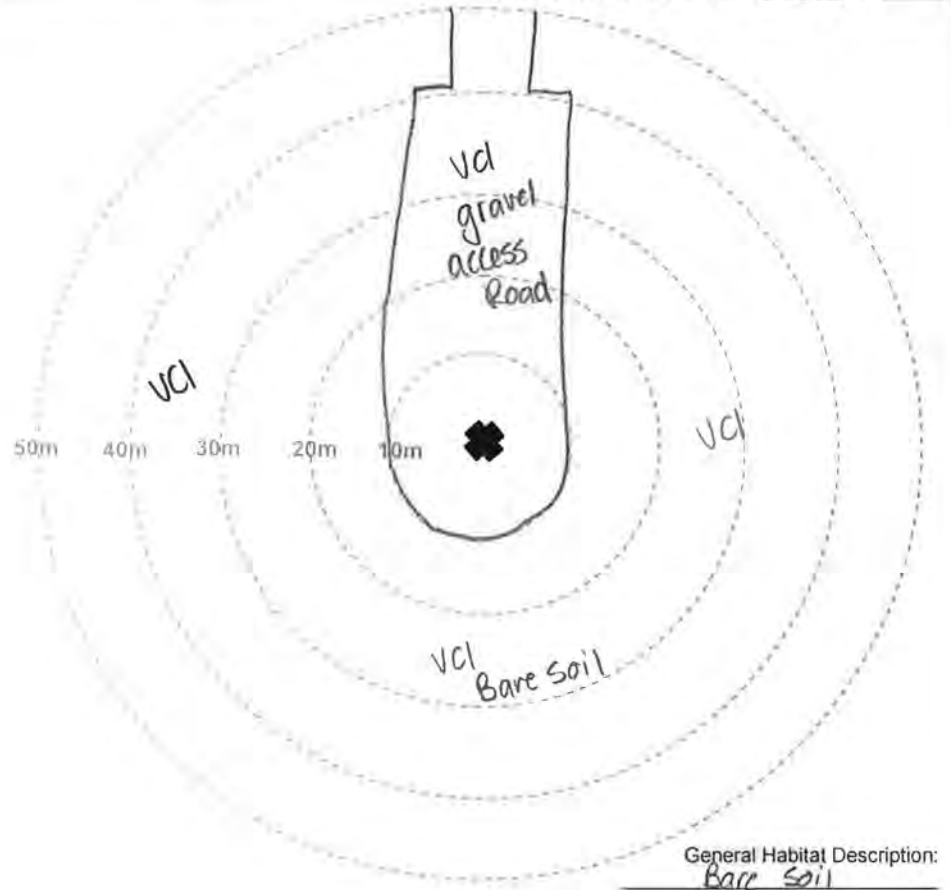
Photo Numbers (from turbine base)  
 Facing North: 122 859  
 Facing East: 122 313  
 Facing South: 122 328  
 Facing West: 122 347  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04/10/22

Observer: KLB, MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



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

# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408C Turbine #: T38 Degree of Slope      degrees Slope Orientation      (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 0102  
 Facing East: 5978  
 Facing South: 2271  
 Facing West: 9326  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 06/05/22

Observer: MGB, KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N

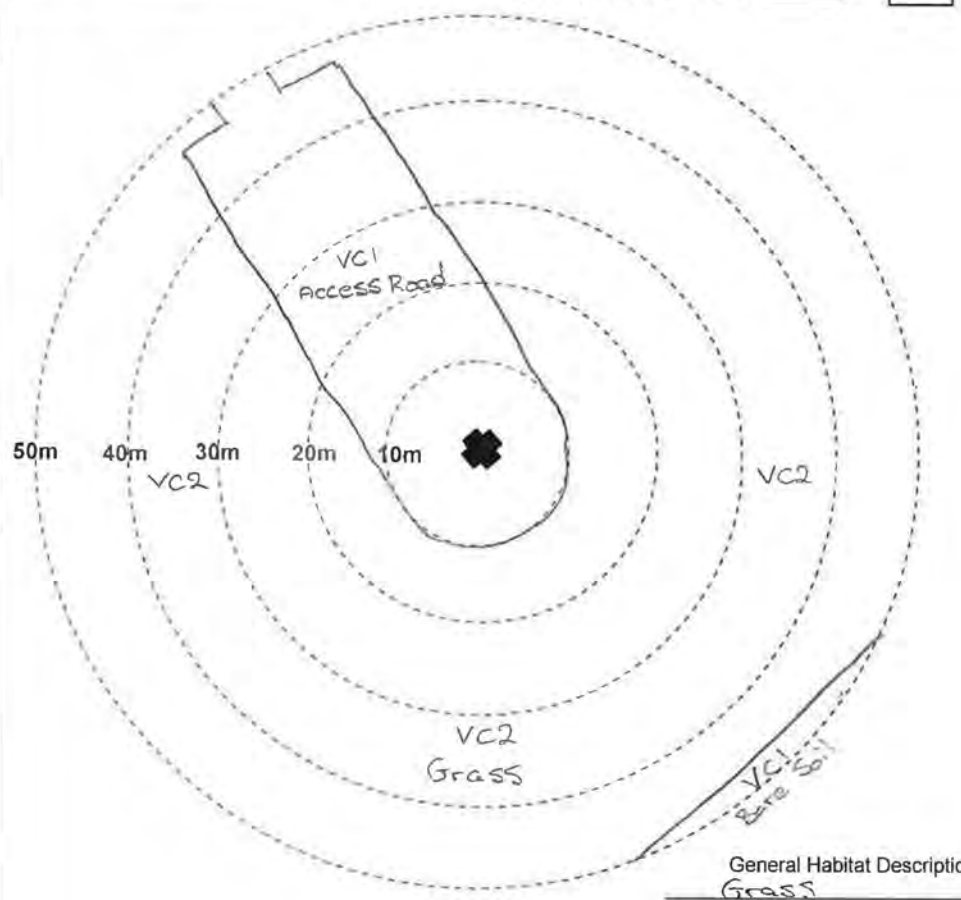
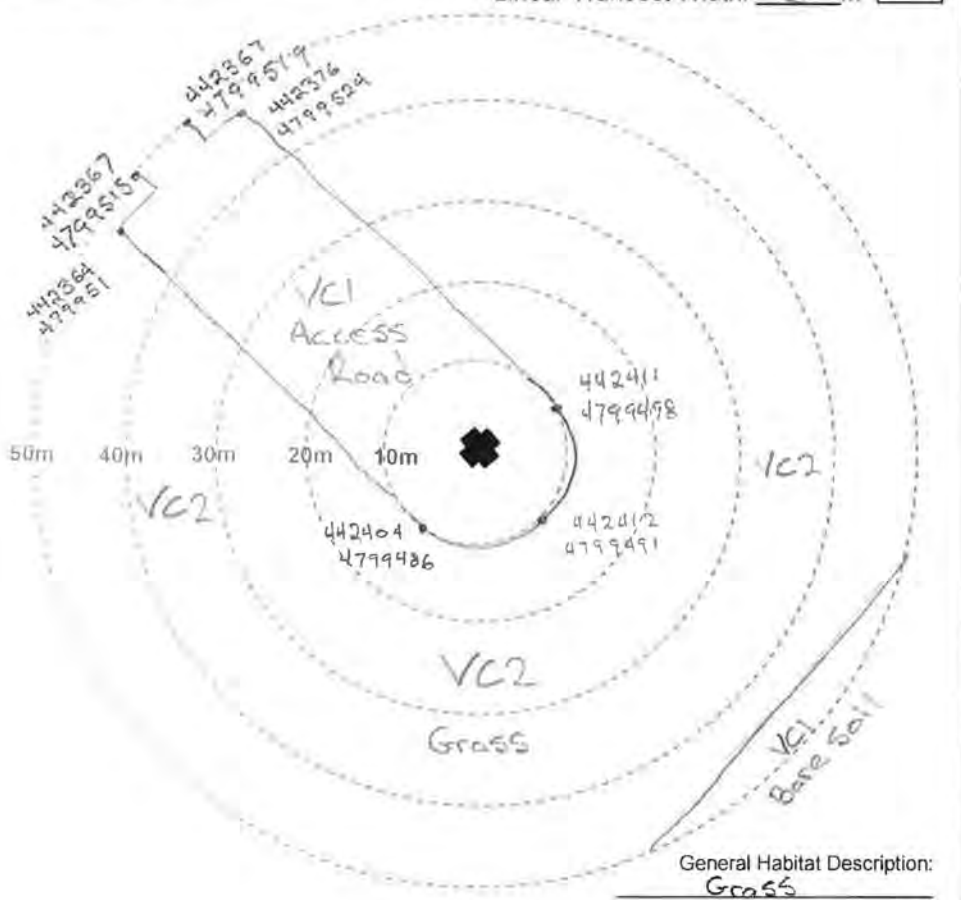
Photo Numbers (from turbine base)  
 Facing North: 3574  
 Facing East: 8336  
 Facing South: 5118  
 Facing West: 6732  
 (sketch habitat and visibility classes)

Date (DD/MM/YY):     /    /    

Observer:     

Monthly/Seasonal  
 Linear Transect Width:      m

↑  
N



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

# Visibility Class Map

Project Name: Grand Bend LWF Project #: 2408 Turbine #: T38

Photo Numbers (from turbine base)  
 Facing North: 105451  
 Facing East: 105509  
 Facing South: 105519  
 Facing West: 105525  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 05/07/22

Observer: MGR

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N

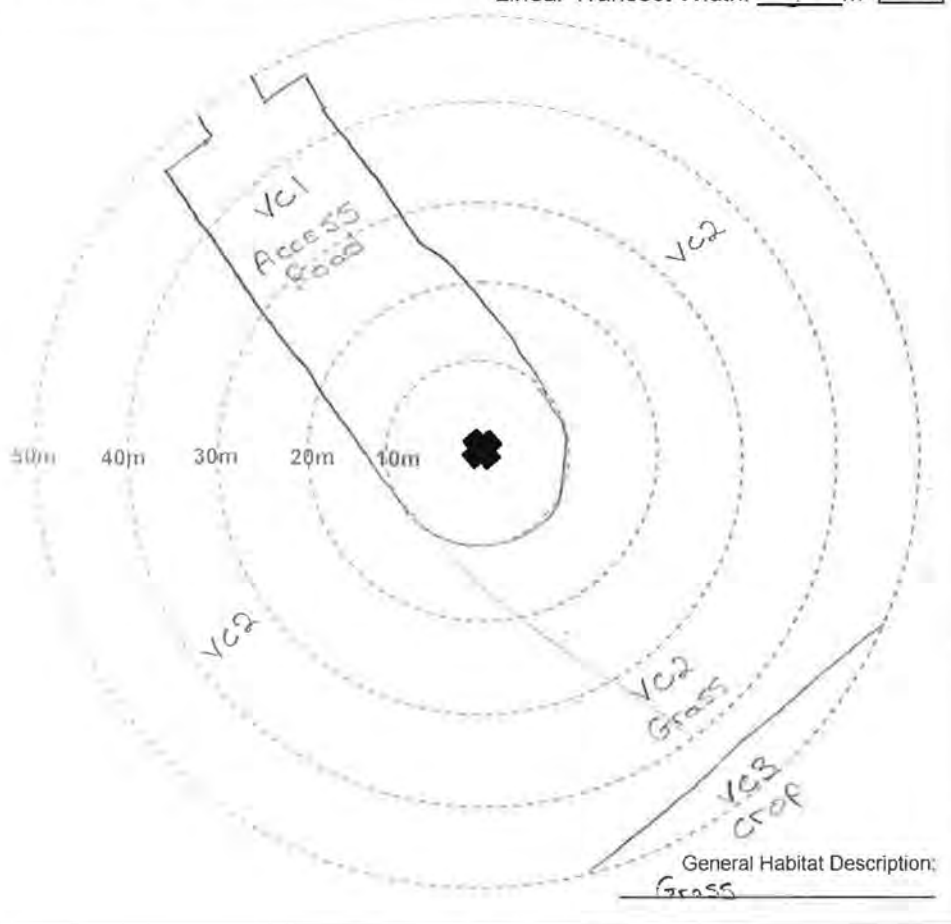


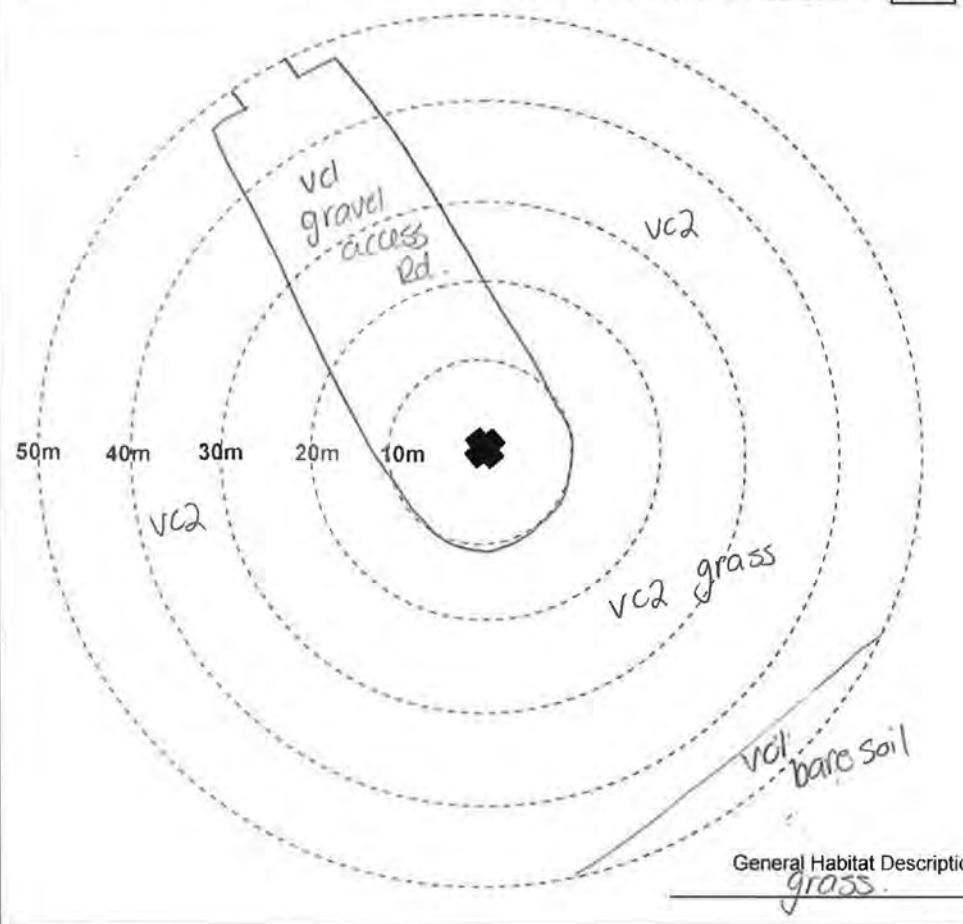
Photo Numbers (from turbine base)  
 Facing North: 104744  
 Facing East: 104756  
 Facing South: 104811  
 Facing West: 104819  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 05/08/22

Observer: KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



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

# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408C Turbine #: T38

Photo Numbers (from turbine base)  
 Facing North: 100925  
 Facing East: 100940  
 Facing South: 100948  
 Facing West: 100954  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/09/22

Observer: VLB, MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

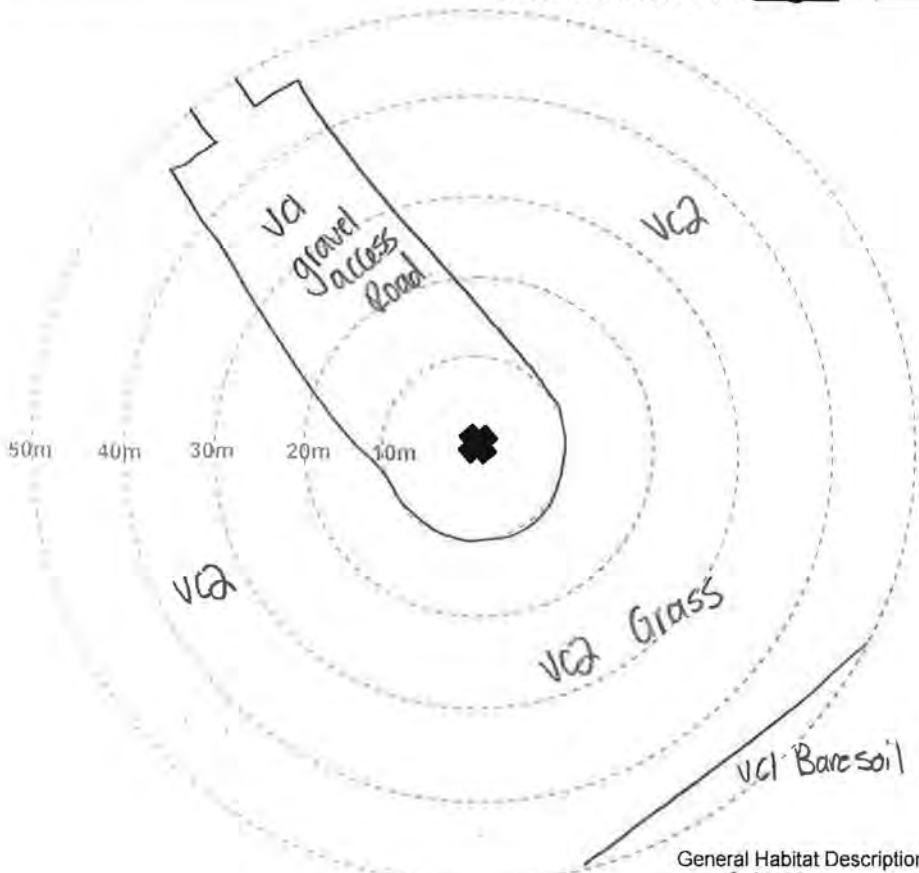


Photo Numbers (from turbine base)  
 Facing North: 103648  
 Facing East: 103703  
 Facing South: 103716  
 Facing West: 103726  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04/10/22

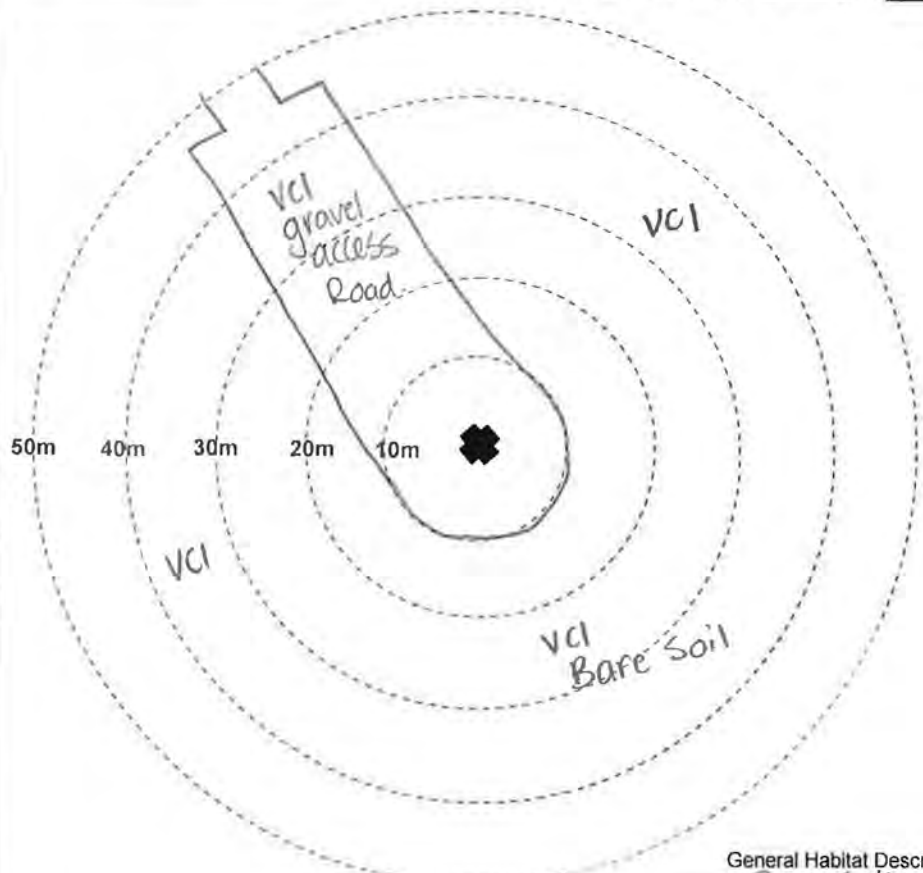
Observer: VLB, MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m



General Habitat Description:

grass



General Habitat Description:

Bare Soil

## 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: Grand Bend LRP Project #: 2408 Turbine #: T42 Degree of Slope      degrees Slope Orientation      (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 0477  
 Facing East: 1315  
 Facing South: 4847  
 Facing West: 8563  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/05/20

Observer: MGB, KLB

Monthly/Seasonal  
 Linear Transect Width:      m

↑  
N

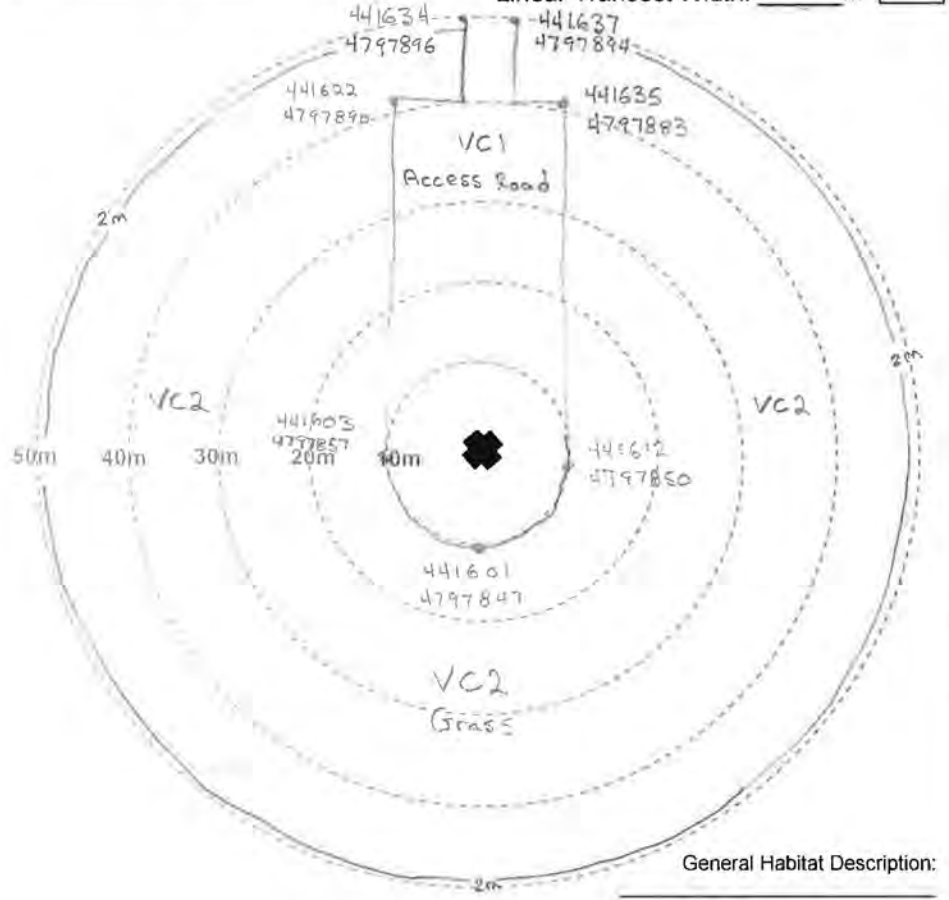


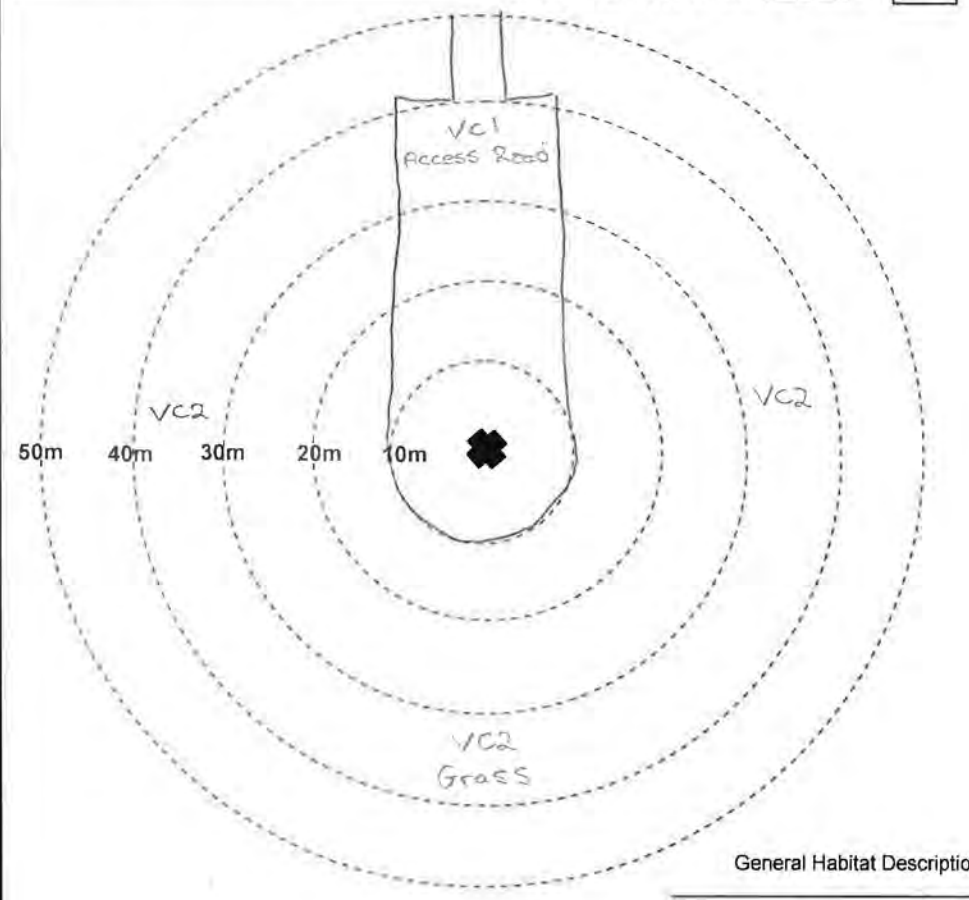
Photo Numbers (from turbine base)  
 Facing North: 0301  
 Facing East: 9745  
 Facing South: 7983  
 Facing West: 6666  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/06/20

Observer: MGB, KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



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

# Visibility Class Map

Project Name: Grand Bend WLF Project #: 2408c Turbine #: 742

Photo Numbers (from turbine base)  
 Facing North: 095748  
 Facing East: 095759  
 Facing South: 095811  
 Facing West: 095825  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 05/07/22  
 Observer: MGR  
 Monthly/Seasonal  
 Linear Transect Width: 3 m

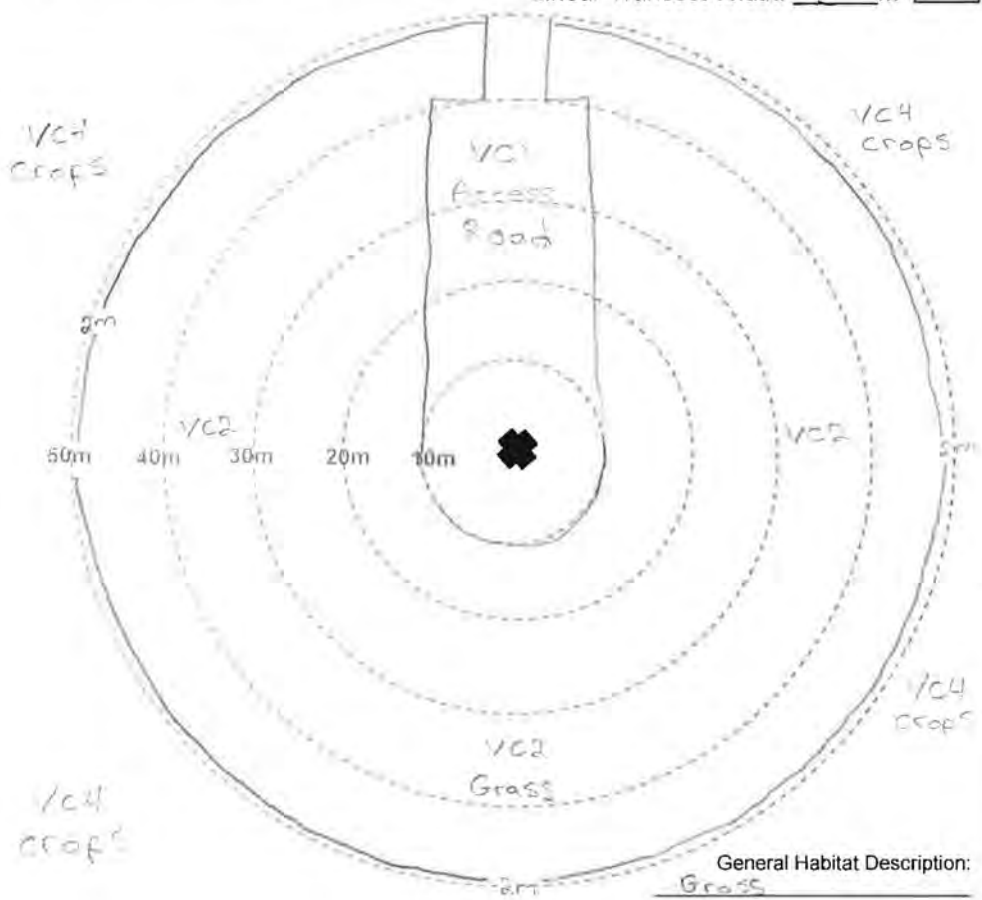
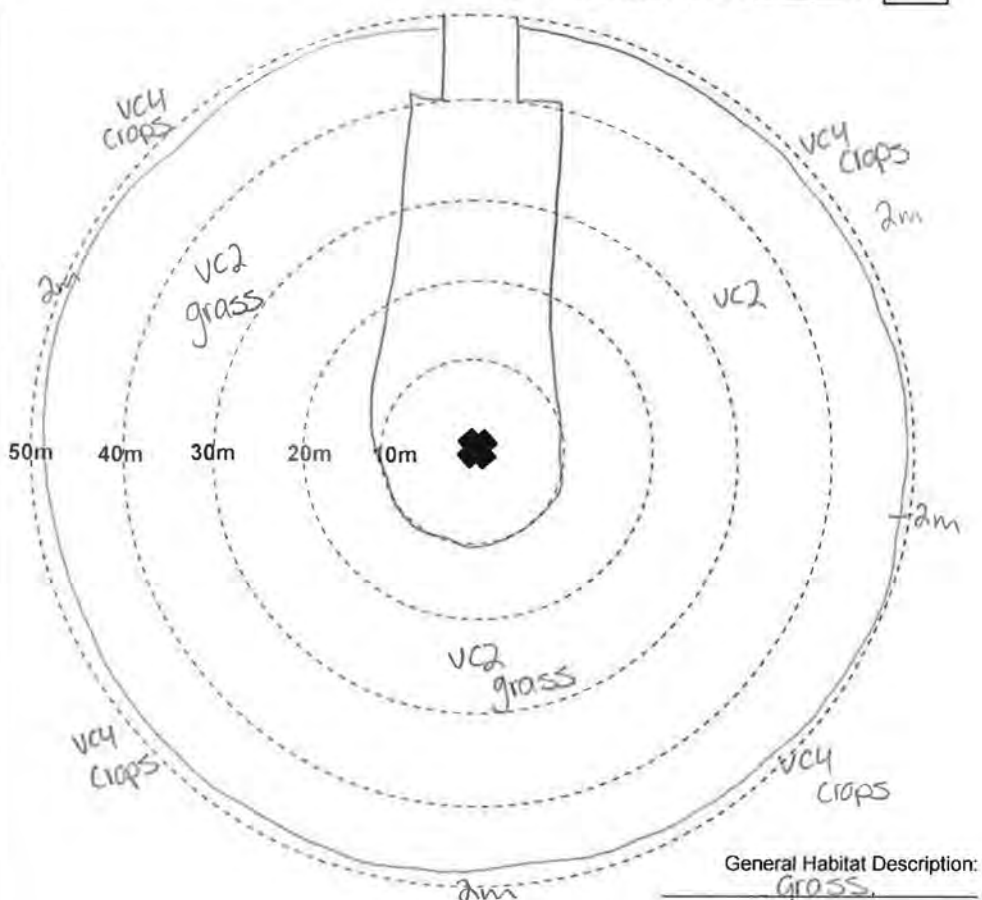


Photo Numbers (from turbine base)  
 Facing North: 094404  
 Facing East: 094411  
 Facing South: 094420  
 Facing West: 094450  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 05/08/22  
 Observer: KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



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



# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408C Turbine #: T42

Photo Numbers (from turbine base)  
 Facing North: 091 507  
 Facing East: 091 518  
 Facing South: 091 533  
 Facing West: 091 545  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/09/22

Observer: KL, MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N

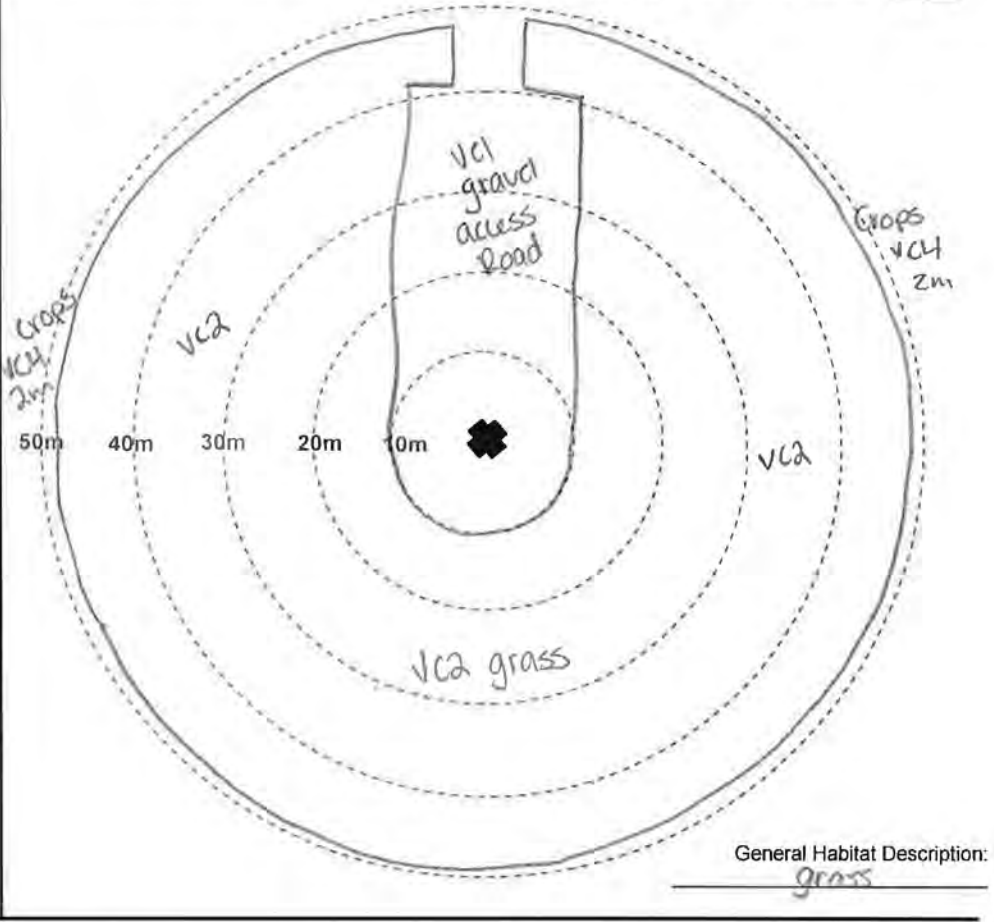
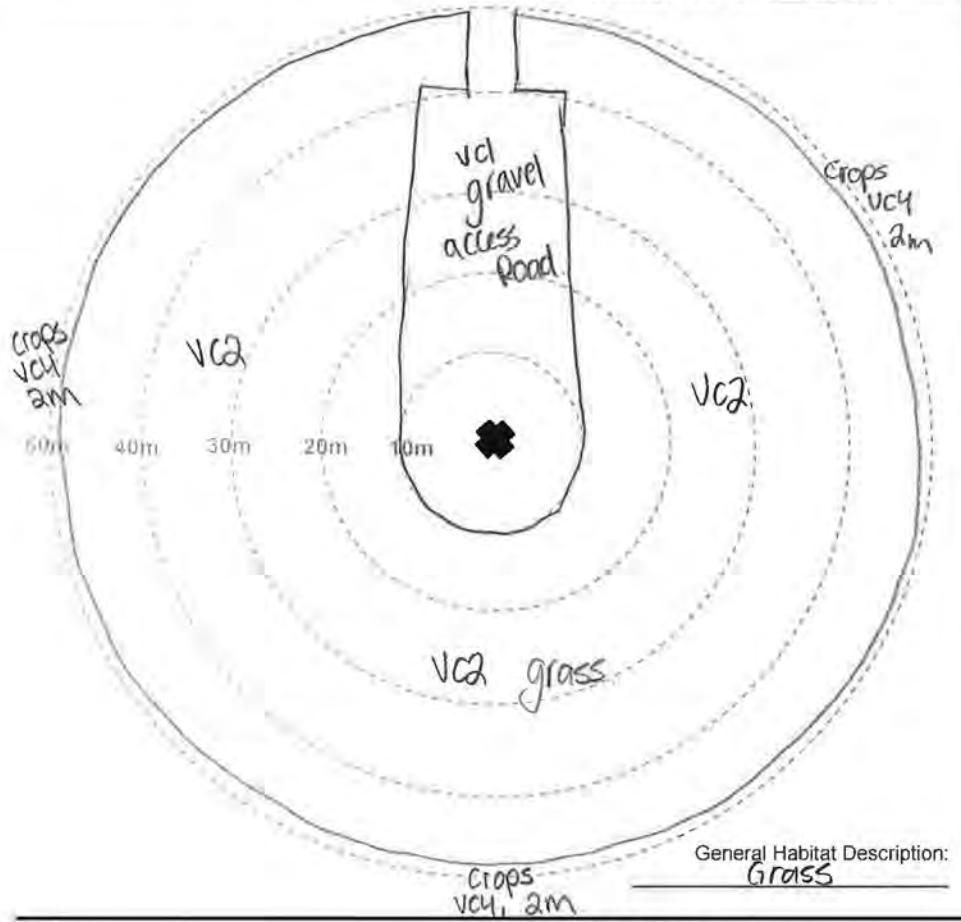
Photo Numbers (from turbine base)  
 Facing North: 094 252  
 Facing East: 094 202  
 Facing South: 094 216  
 Facing West: 094 329  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04/10/22

Observer: KL, MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



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

# Visibility Class Map

Project Name: Grand Bend W/F Project #: 2408r Turbine #: T48 Degree of Slope / degrees Slope Orientation / (e.g. SSW)

**Photo Numbers (from turbine base)**

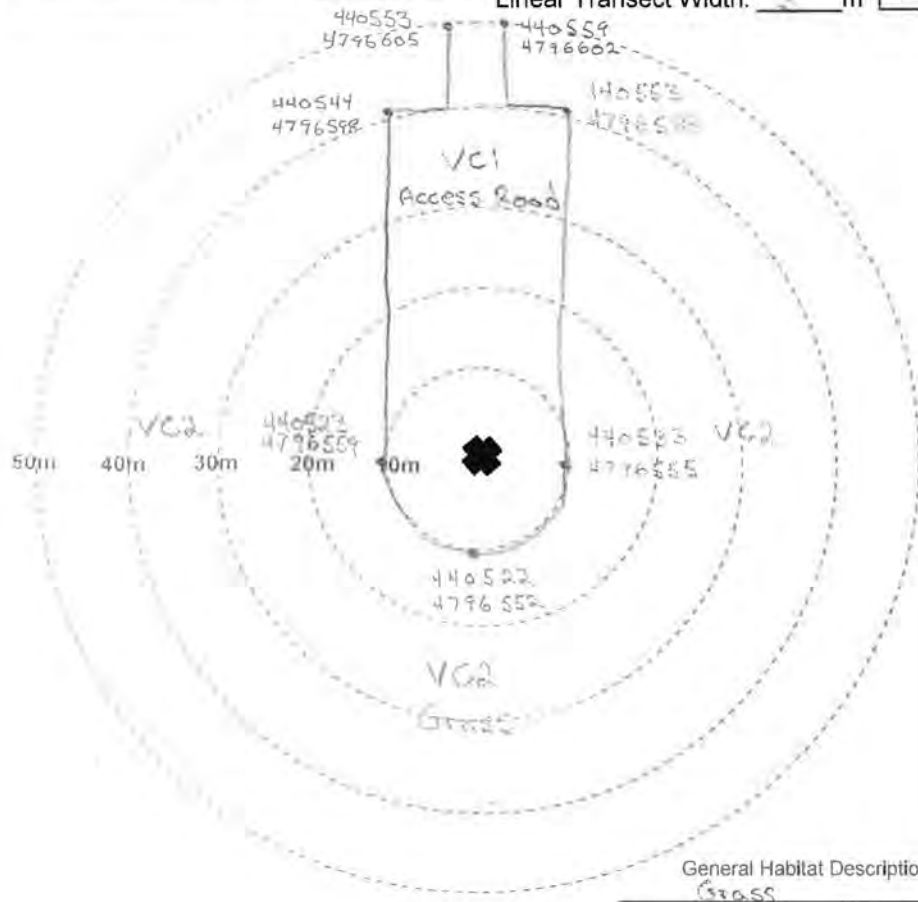
Facing North: 3567  
 Facing East: 2539  
 Facing South: 9448  
 Facing West: 6694

(sketch habitat and visibility classes)

Date (DD/MM/YY): 03/06/20

Observer: MGR, KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m



**Photo Numbers (from turbine base)**

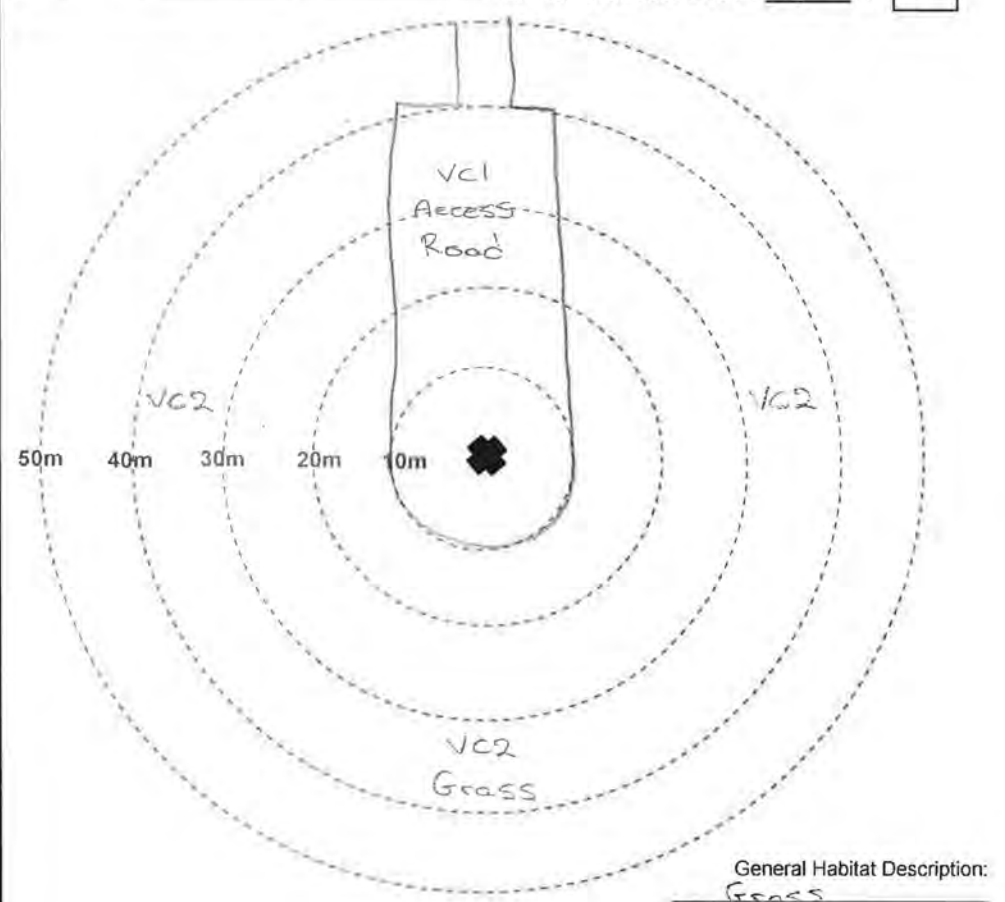
Facing North: 9815  
 Facing East: 9322  
 Facing South: 9356  
 Facing West: 8733

(sketch habitat and visibility classes)

Date (DD/MM/YY): 03/06/20

Observer: MGR, KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m



**VISIBILITY CLASSES**

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



# Visibility Class Map

Project Name: Grand Road WE Project #: 2408c Turbine #: T48

Photo Numbers (from turbine base)  
 Facing North: 090339  
 Facing East: 090348  
 Facing South: 090358  
 Facing West: 090408  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 05/07/22

Observer: MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N

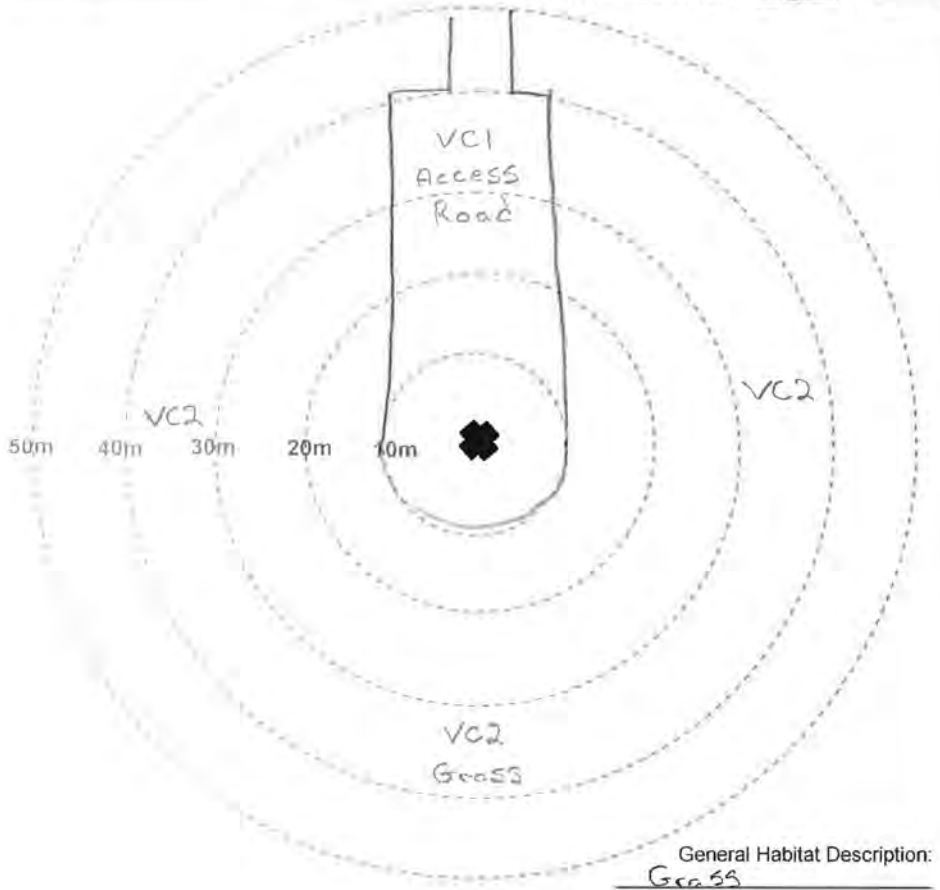


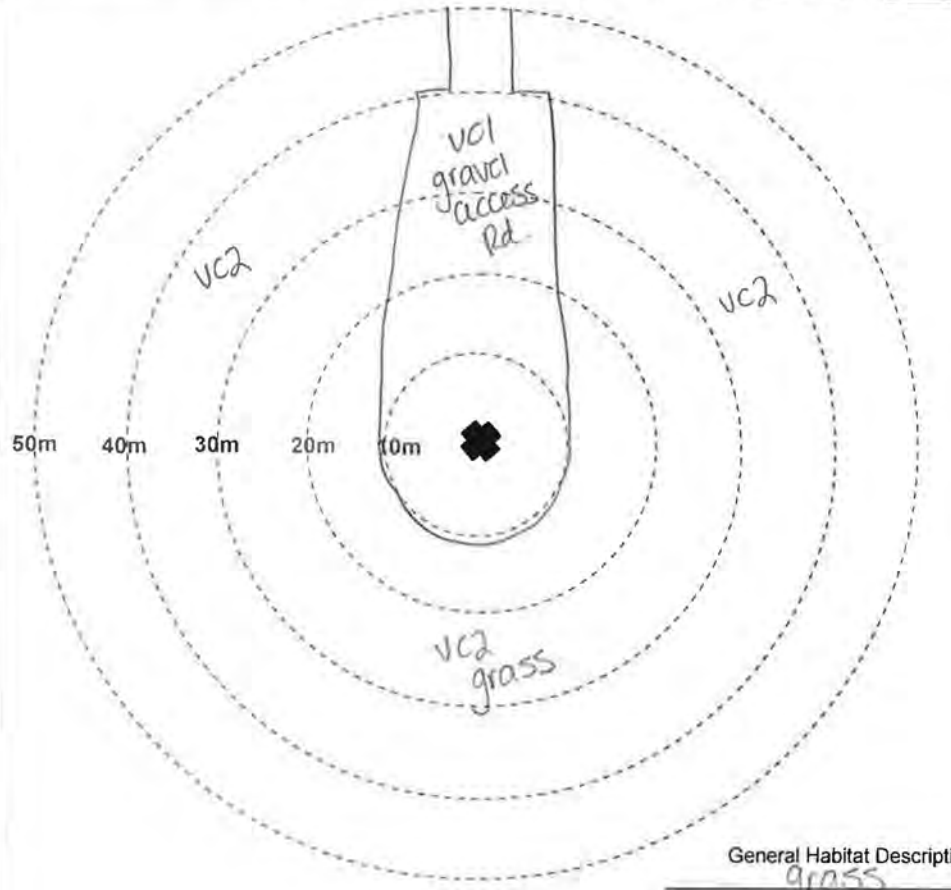
Photo Numbers (from turbine base)  
 Facing North: 084714  
 Facing East: 084721  
 Facing South: 084732  
 Facing West: 084741  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 05/08/22

Observer: KLB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



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

# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408C Turbine #: T48

Photo Numbers (from turbine base)  
 Facing North: 082 947  
 Facing East: 082 954  
 Facing South: 082 004  
 Facing West: 082 011  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02 / 09 / 22

Observer: KLB, MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N

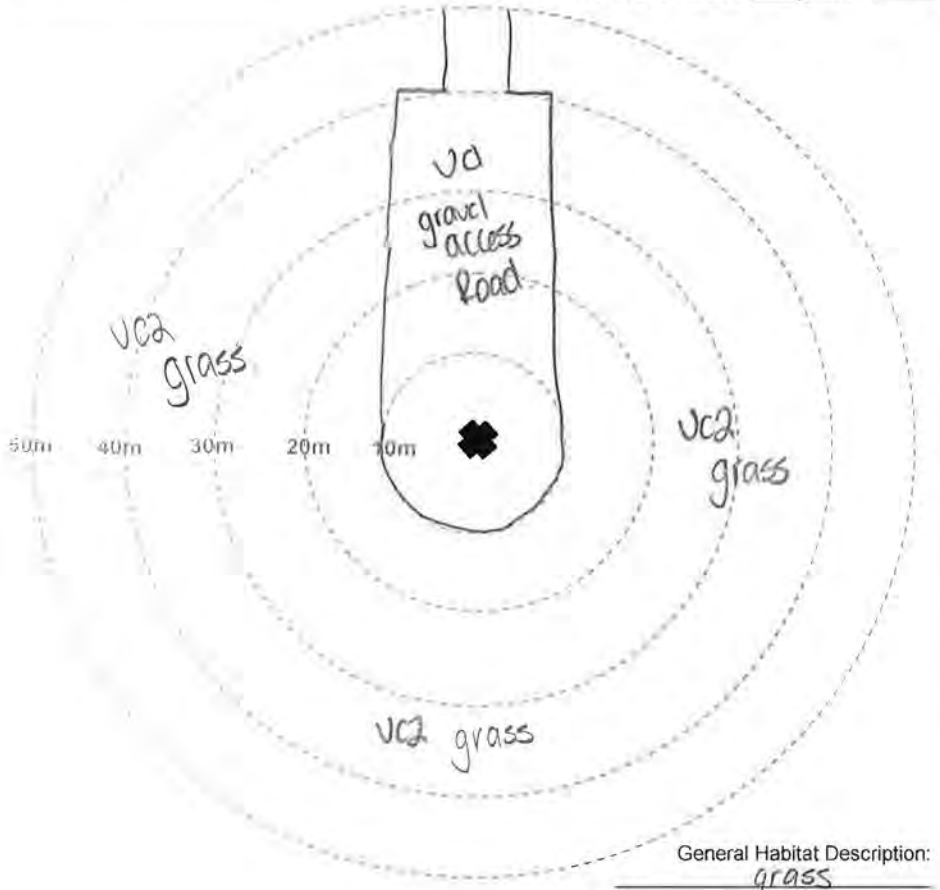


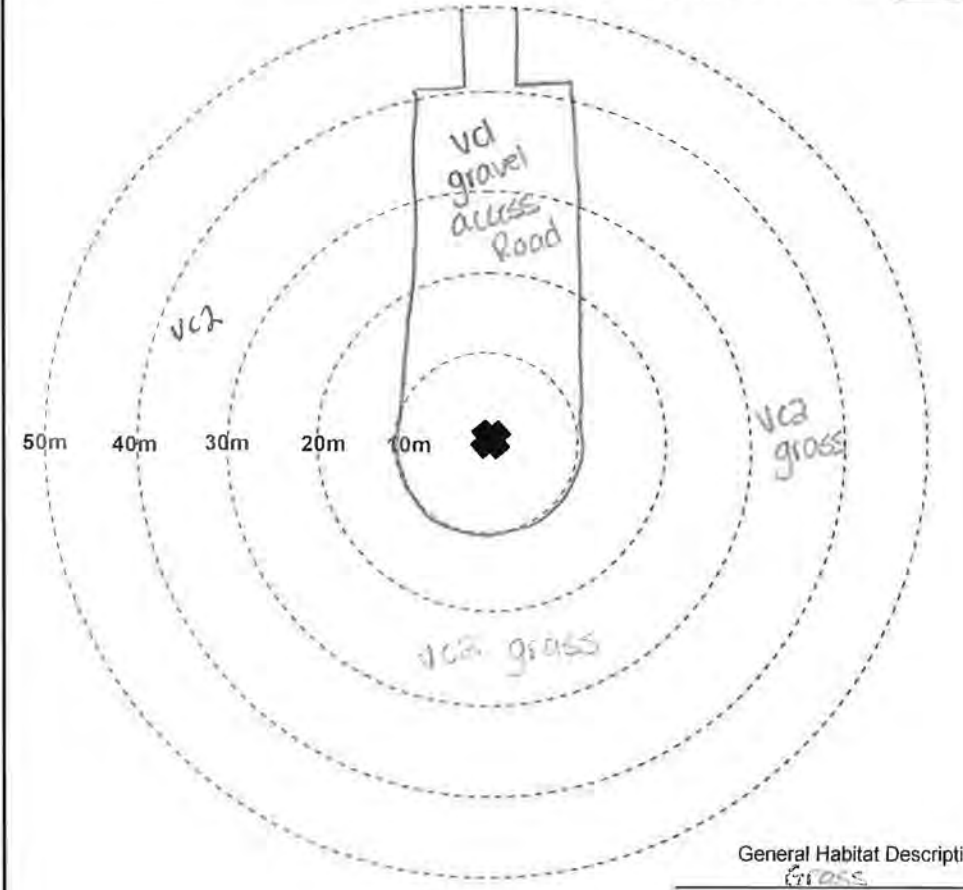
Photo Numbers (from turbine base)  
 Facing North: 084 847  
 Facing East: 084 756  
 Facing South: 084 907  
 Facing West: 084 917  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04 / 10 / 22

Observer: KLB, MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



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

# Visibility Class Map

Project Name: Good Bend WF Project #: 24080 Turbine #: T33 Degree of Slope      degrees Slope Orientation      (e.g. SSW)

Photo Numbers (from turbine base)  
 Facing North: 8325  
 Facing East: 6072  
 Facing South: 5421  
 Facing West: 2297  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 06/05/22

Observer: MGR, KLR

Monthly/Seasonal  
 Linear Transect Width: 2 m

↑  
N

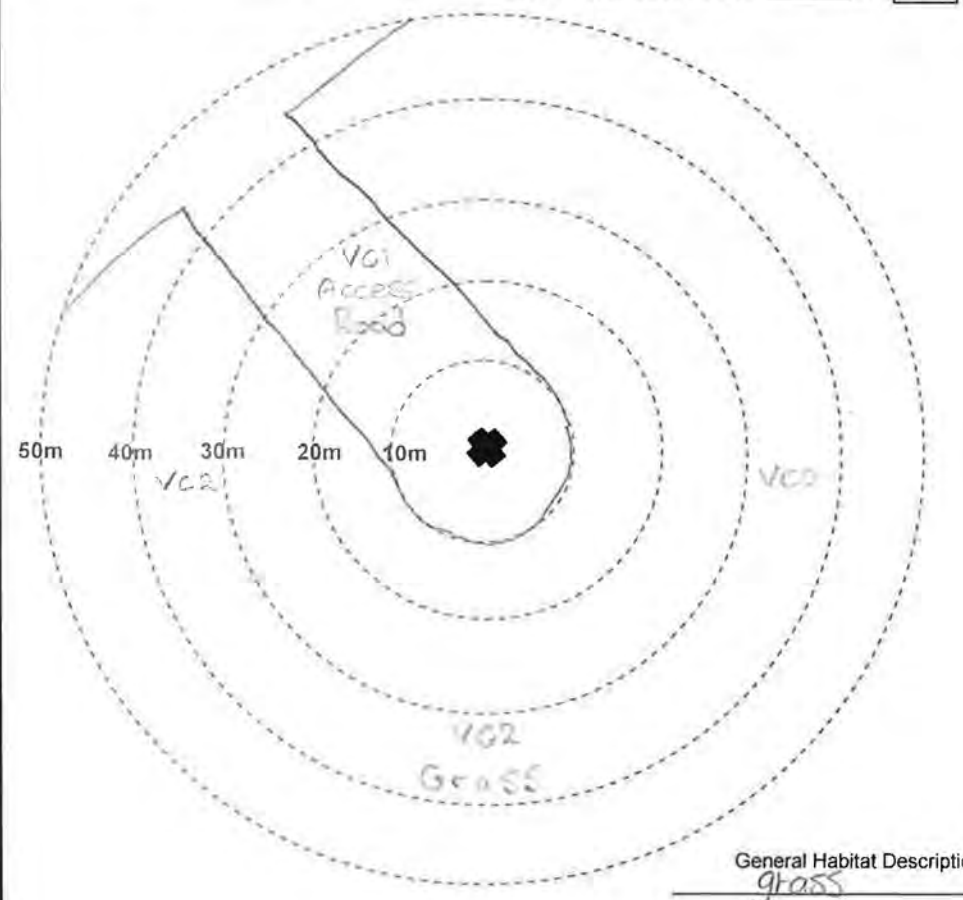
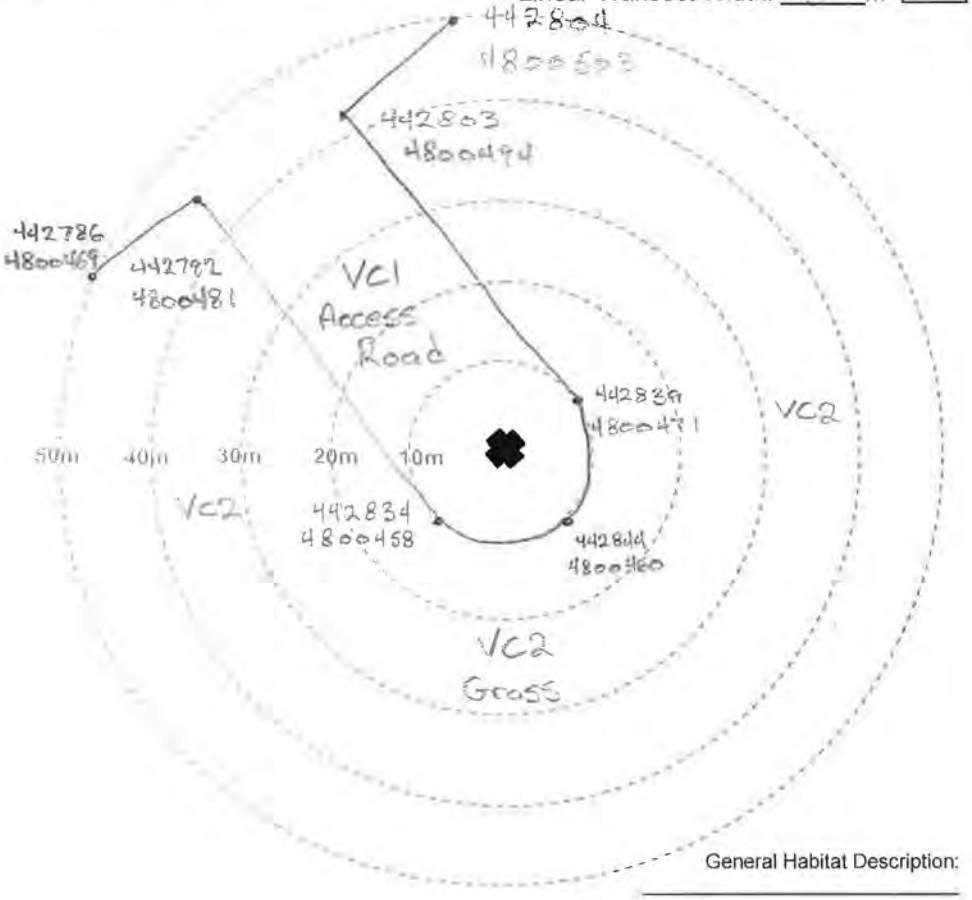
Photo Numbers (from turbine base)  
 Facing North: 9664  
 Facing East: 8028  
 Facing South: 5217  
 Facing West: 3193  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 03/06/22

Observer: MGR, KLR

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



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

# Visibility Class Map

Project Name: Grand Bend WE Project #: 2408C Turbine #: T35

Photo Numbers (from turbine base)  
 Facing North: 114010  
 Facing East: 114029  
 Facing South: 114027  
 Facing West: 114033  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 05/07/22  
 Observer: MGB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m

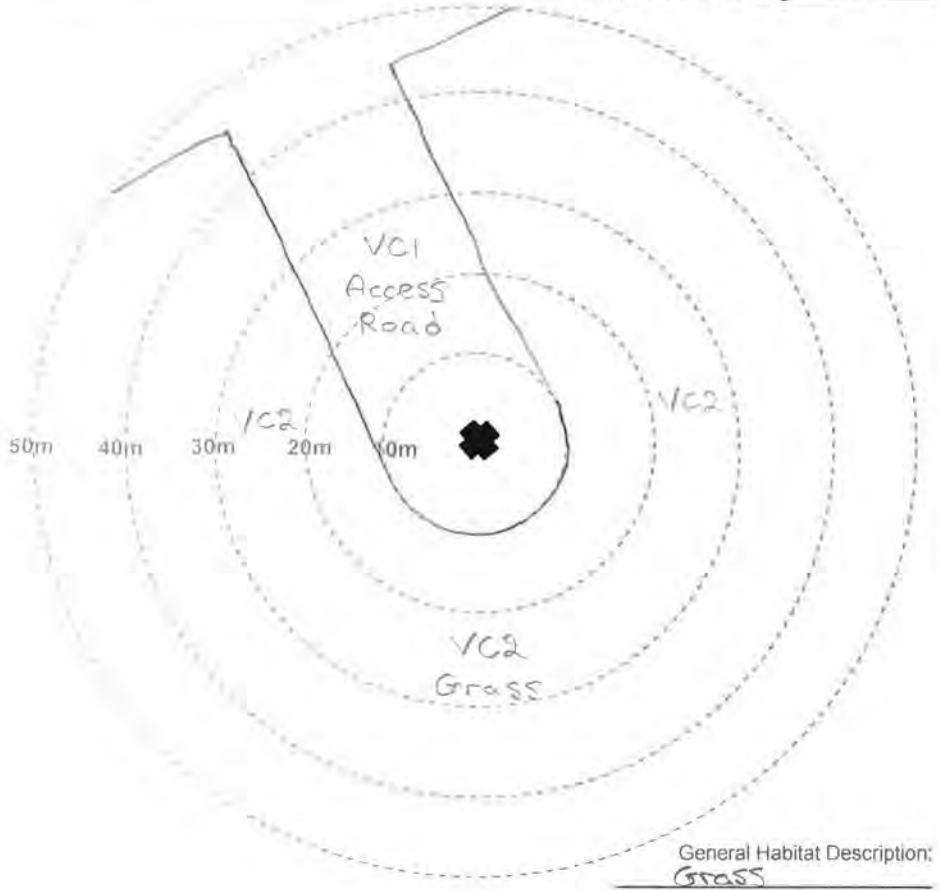
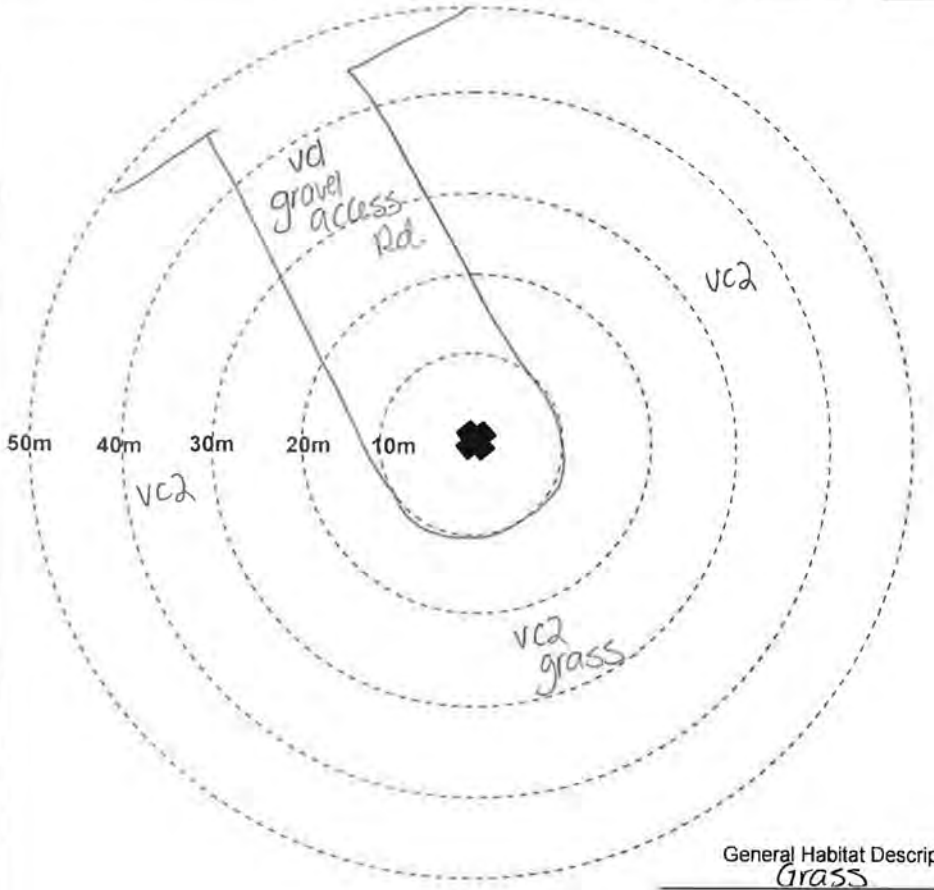


Photo Numbers (from turbine base)  
 Facing North: 113732  
 Facing East: 113750  
 Facing South: 113759  
 Facing West: 113809  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/08/22  
 Observer: KLB  
 Monthly/Seasonal  
 Linear Transect Width: 3 m



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

# Visibility Class Map

Project Name: Grand Bend WF Project #: 2408C Turbine #: T33

Photo Numbers (from turbine base)  
 Facing North: 110 648  
 Facing East: 110 705  
 Facing South: 110 714  
 Facing West: 110 722  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 02/09/22

Observer: KLB, MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N

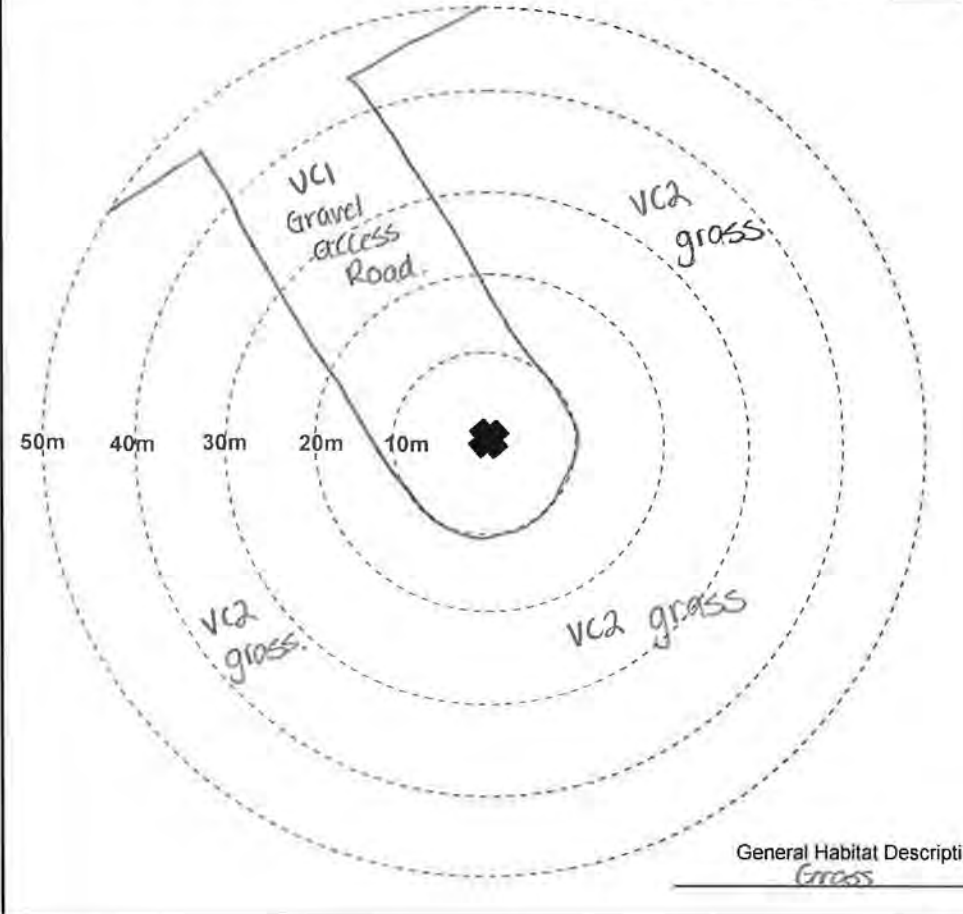
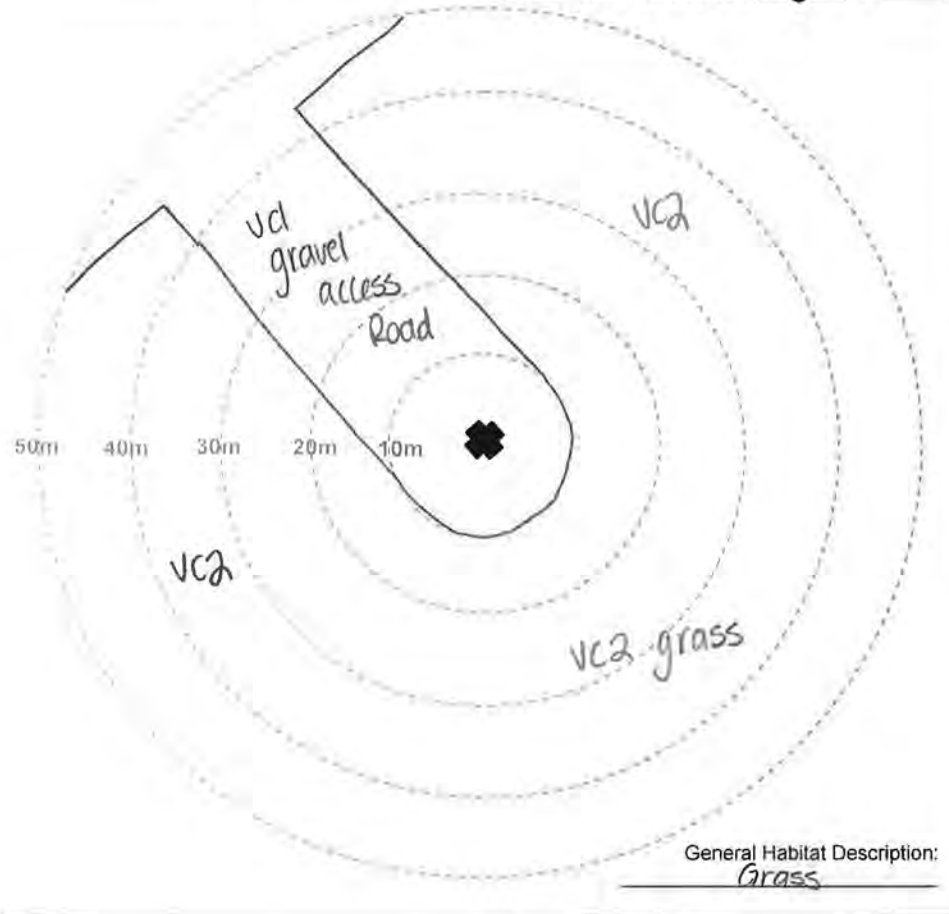
Photo Numbers (from turbine base)  
 Facing North: 113 034  
 Facing East: 113 039  
 Facing South: 113 047  
 Facing West: 113 057  
 (sketch habitat and visibility classes)

Date (DD/MM/YY): 04/10/22

Observer: KLB, MGB

Monthly/Seasonal  
 Linear Transect Width: 3 m

↑  
N



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

**Appendix V**  
Bat Mortalities

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Appendix V  
 2408C Grand Bend Wind Farm  
 2022 Bat Mortalities

Date	Turbine	Start Time	End Time	Dog Used (Y/N)	Days Since Last Search	Temp.	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
10-May-22	T31	11:55	12:25	N	4	15	80	None	5	E	Silver-haired Bat	2408C-100522-T31-02	41	F	443529	4801109	15	267	F	12	Laceration above left wing	Bare soil	1
30-May-22	T17	11:25	11:55	N	4	23	10	Fog	5	S	Silver-haired Bat	2408C-300522-T17-01	40	F	443392	4805364	20	72	E	36	None observed	Bare soil	1
2-Jun-22	T17	12:05	12:35	N	4	11	75	None	3	NW	Eastern Red Bat	2408C-020622-T17-02	36	M	443343	4805586	41	320	E	36	Lower spine broken	Bare soil	1
14-Jun-22	T31	11:30	12:00	N	4	21	20	None	5	E	Silver-haired Bat	2408C-140622-T31-03	N/A	M	443546	4801110	7	85	E	36	None observed	Gravel	1
17-Jun-22	T27	12:55	13:05	N	3	21	1	None	5	SW	Silver-haired Bat	2408C-170622-T27-01	40	M	443634	4803685	0	335	A	84	None observed	Concrete Pad	1
17-Jun-22	T27	12:55	13:05	N	3	21	1	None	5	SW	Hoary Bat	2408C-170622-T27-02	57	F	443673	4803691	37	75	M	60	None observed	Bare soil	1
23-Jun-22	T07	9:30	10:00	N	3	15	0	None	4	NW	Eastern Red Bat	2408C-230622-T07-01	41	M	443933	4809171	25	340	A	60	None observed	Bare soil	1
28-Jun-22	T42	9:15	9:45	N	4	15	10	None	4	W	Eastern Red Bat	2408C-280622-T42-01	38	M	441614	4797840	12	75	F	12	Laceration on jaw	Bare soil	1
8-Jul-22	T33	11:00	11:30	N	3	22	15	None	2	NW	Big Brown Bat	2408C-080722-T33-04	46	F	442808	4800448	31	235	A	60	Broken spine and left wing	Grass	2
8-Jul-22	T31	12:10	12:40	N	3	22	15	None	2	NW	Little Brown Myotis	2408C-080722-T31-05	37	U	443541	4801118	5	350	A	60	None observed	Gravel	1
8-Jul-22	T31	12:10	12:40	N	3	22	15	None	2	NW	Eastern Red Bat	2408C-080722-T31-06	41	U	443509	4801106	30	265	A	60	None observed	Bare soil	1
12-Jul-22	T48	8:35	9:05	N	4	20	95	None	6	W	Eastern Red Bat	2408C-120722-T48-01	39	M	440548	4796555	22	60	F	12	Laceration on right shoulder	Grass	2
26-Jul-22	T48	8:45	9:15	N	4	18	80	None	3	SW	Eastern Red Bat	2408C-260722-T48-01	39	M	440538	4796533	21	140	M	60	None observed	Bare soil	1
2-Aug-22	T42	9:52	10:22	N	4	18	100	None	3	NW	Hoary Bat	2408C-020822-T42-01	53	F	441637	4797863	26	60	M	60	None observed	Grass	2
5-Aug-22	T20	14:21	14:46	N	3	21	90	None	2	NE	Hoary Bat	2408C-050822-T20-01	53	M	446928	4804790	33	149	F	12	None observed	Bare soil	1
8-Aug-22	T02	8:40	9:10	N	4	23	100	Rain and Fog	3	SW	Hoary Bat	2408C-080822-T02-01	52	M	443367	4811799	38	340	E	36	None observed	Bare soil	1
8-Aug-22	T07	9:36	10:06	N	4	23	100	Rain and Fog	3	SW	Hoary Bat	2408C-080822-T07-01	53	M	443974	4809177	31	30	F	12	Laceration on chest	Bare soil	1
8-Aug-22	T20	13:10	13:40	N	3	23	100	Rain and Fog	3	SW	Silver-haired Bat	2408C-080822-T20-01	42	U	446873	4804823	36	260	A	60	None observed	Bare soil	1
9-Aug-22	T38	10:13	10:43	N	4	23	20	None	3	N	Hoary Bat	2408C-090822-T38-02	53	F	442400	4799493	8	270	M	36	None observed	Gravel	1
9-Aug-22	T38	10:13	10:43	N	4	23	20	None	3	N	Big Brown Bat	2408C-090822-T38-04	44	M	442380	4799516	33	310	M	36	None observed	Gravel	1
12-Aug-22	T27	12:14	12:44	N	3	15	0	None	2	S	Hoary Bat	2408C-120822-T27-01	53	M	443634	4803687	7	340	F	12	Laceration on back	Gravel	1
12-Aug-22	T27	12:14	12:44	N	3	15	0	None	2	S	Silver-haired Bat	2408C-120822-T27-02	41	M	443609	4803682	26	270	F	12	Laceration on left wing and back	Gravel	1
16-Aug-22	T48	8:35	9:05	N	4	16	0	None	2	E	Silver-haired Bat	2408C-160822-T48-01	44	M	440500	4796585	39	300	F	12	Infection or disease around mouth/ears	Grass	2
22-Aug-22	T20	12:16	12:46	N	4	19	100	Fog	3	N	Hoary Bat	2408C-220822-T20-02	53	F	446923	4804861	39	350	E	36	Laceration to left side of torso	Bare soil	1
23-Aug-22	T48	8:36	9:06	N	4	18	5	None	3	NW	Eastern Red Bat	2408C-230822-T48-01	41	F	440530	4796556	0	0	F	12	None observed	Concrete Pad	1
23-Aug-22	T42	9:32	10:02	N	4	18	5	None	3	NW	Hoary Bat	2408C-230822-T42-01	57	F	441630	4797843	24	100	F	12	Lower jaw removed	Grass	2
23-Aug-22	T42	9:32	10:02	N	4	18	5	None	3	NW	Big Brown Bat	2408C-230822-T42-02	45	M	441627	4797830	27	130	F	12	Break in forearm	Grass	2
29-Aug-22	T02	8:40	9:10	N	4	24	60	None	3	S	Hoary Bat	2408C-290822-T02-01	53	M	444343	4811762	32	270	F	12	None observed	Bare soil	1
29-Aug-22	T02	8:40	9:10	N	4	24	60	None	3	S	Hoary Bat	2408C-290222-T02-02	53	M	444325	4811756	47	260	M	36	Break in right forearm	Bare soil	1
29-Aug-22	T02	8:40	9:10	N	4	24	60	None	3	S	Little Brown Myotis	2408C-290822-T02-03	39	F	444382	4811791	29	20	F	12	Laceration on torso	Bare soil	1
29-Aug-22	T07	10:18	10:48	N	4	24	60	None	3	S	Hoary Bat	2408C-290822-T07-01	53	F	443917	4809154	37	280	F	12	Break in both forearms	Bare soil	1
1-Sep-22	T17	12:55	13:25	N	3	16	5	None	2	NW	Eastern Red Bat	2408C-010922-T17-01	43	F	443349	4805331	39	230	F	12	None observed	Bare soil	1
5-Sep-22	T20	12:35	13:05	N	4	16	100	None	3	E	Silver-haired Bat	2408C-050922-T20-01	39	M	446900	4804829	19	280	F	12	Left forearm broken, laceration left pectoral, right wing broken	Bare soil	1
6-Sep-22	T31	12:15	12:45	N	4	16	30	None	3	NE	Eastern Red Bat	2408C-060922-T31-01	39	F	443508	4801106	30	140	E	36	None observed	Bare soil	1
6-Sep-22	T31	12:15	12:45	N	4	16	30	None	3	NE	Silver-haired Bat	2408C-060922-T31-02	40	F	443555	4801105	17	70	M	60	None observed	Bare soil	1
8-Sep-22	T18	10:50	11:20	N	3	12	5	None	2	SE	Hoary Bat	2408C-080922-T18-01	51	F	443731	4805291	48	160	E	36	None observed	Bare soil	1
8-Sep-22	T18	10:50	11:20	N	3	12	5	None	2	SE	Hoary Bat	2408C-080922-T18-02	54	F	443692	4805310	36	220	F	12	None observed	Bare soil	1
9-Sep-22	T27	12:25	12:55	N	3	13	0	None	3	SE	Silver-haired Bat	2408C-090922-T27-01	40	M	443605	4803707	41	300	M	60	None observed	Bare soil	1
13-Sep-22	T42	9:40	10:10	N	4	13	85	None	2	E	Eastern Red Bat	2408C-130922-T42-01	45	U	441600	4797877	27	320	S	12	Only wing remains, broken forearm	Grass	2
13-Sep-22	T33	11:15	11:45	N	4	13	85	None	2	E	Hoary Bat	2408C-130922-T33-01	52	U	442814	4800459	24	240	S	36	Only wing remains, broken forearm	Grass	2
13-Sep-22	T31	12:00	12:30	N	4	13	85	None	2	E	Silver-haired Bat	2408C-130922-T31-01	41	M	443503	4801114	33	33	E	36	None observed	Bare soil	1
16-Sep-22	T31	11:45	12:15	N	3	16	80	None	3	SE	Eastern Red Bat	2408C-160922-T31-01	42	F	443560	4801100	25	100	A	60	None observed	Bare soil	1
16-Sep-22	T31	11:45	12:15	N	3	16	80	None	3	SE	Silver-haired Bat	2408C-160922-T31-02	40	U	443584	4801105	43	100	A	60	None observed	Bare soil	1
28-Oct-22	T38	10:15	10:45	N	3	2	50	None	2	E	Big Brown Bat	2408C-281022-T08-01	46	F	442370	4799508	39	280	F	12	Severed in half	Bare soil	1

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: F Fresh  
 E Early decomposition  
 M Moderate decomposition  
 A Advanced decomposition  
 C Complete decomposition  
 S Scavenged

**Appendix VI**  
Locations of Bat Mortalities

---



444325

444350

444375

444400

444425

4811825

4811825

4811800

4811800

4811775

4811775

4811750

4811750

4811725

4811725

4811700

4811700

444325

444350

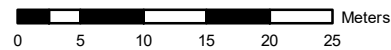
444375

444400






444425



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**Legend**

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

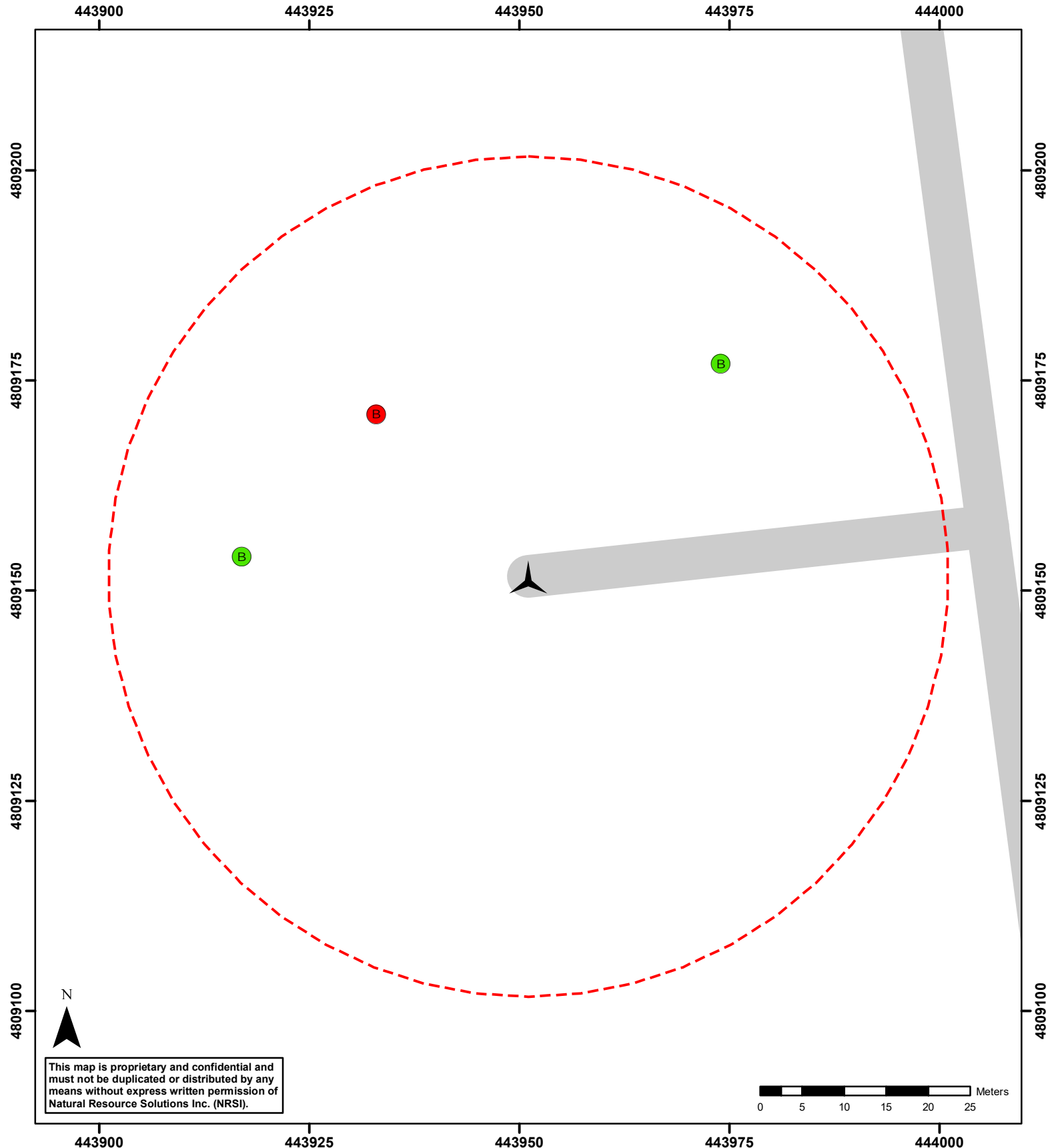
Appendix VI

Grand Bend  
Wind Farm  
**Turbine T02 Mortalities 2022**

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






Date: January 19, 2023  
Project: 2408C





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**Legend**

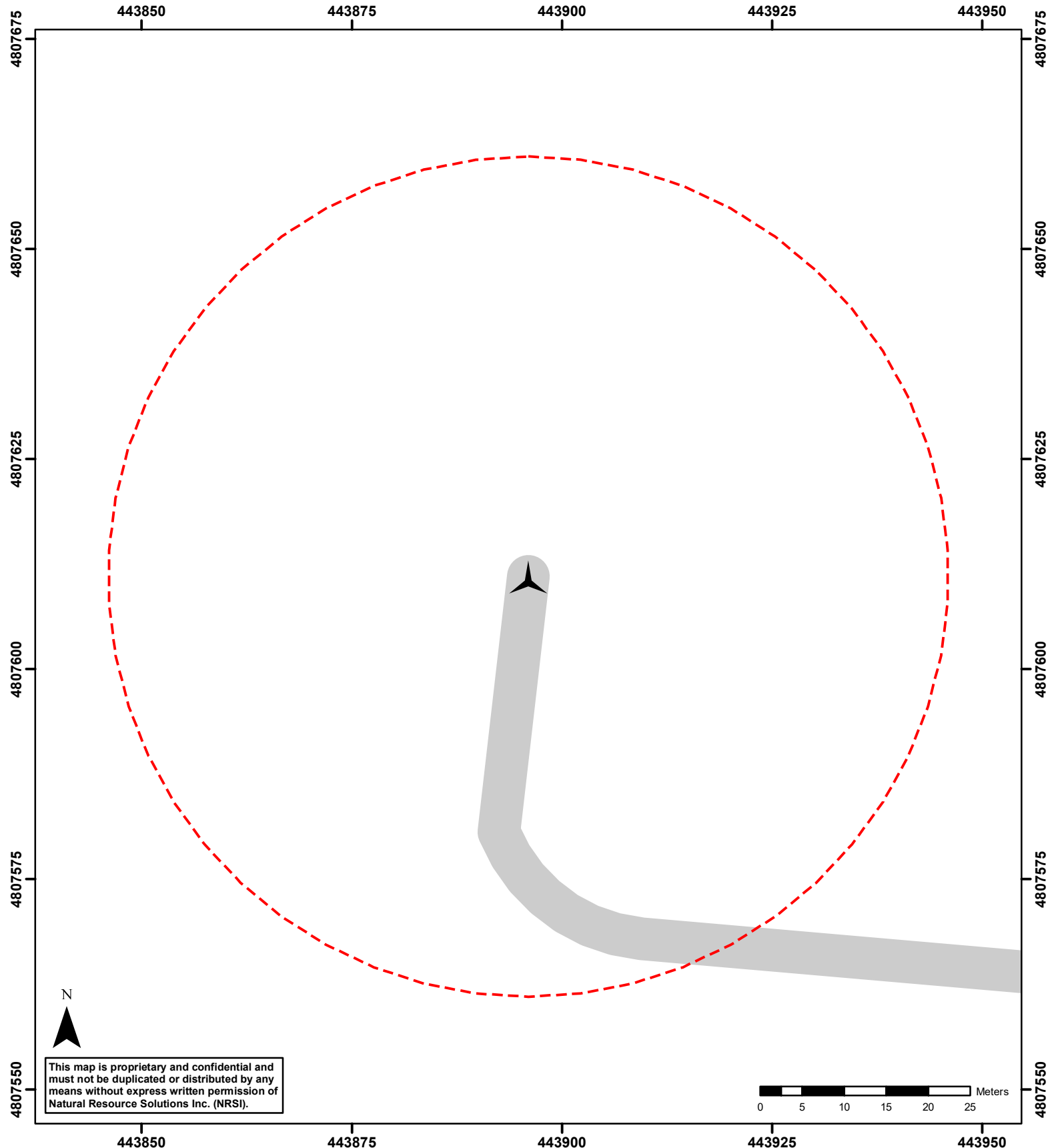
-  Turbine
-  Search Radius (50m)
-  Access Road
-  Eastern Red Bat
-  Hoary Bat

Appendix VI  
 Grand Bend  
 Wind Farm  
**Turbine T07 Mortalities 2022**

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




Date: January 19, 2023  
 Project: 2408C





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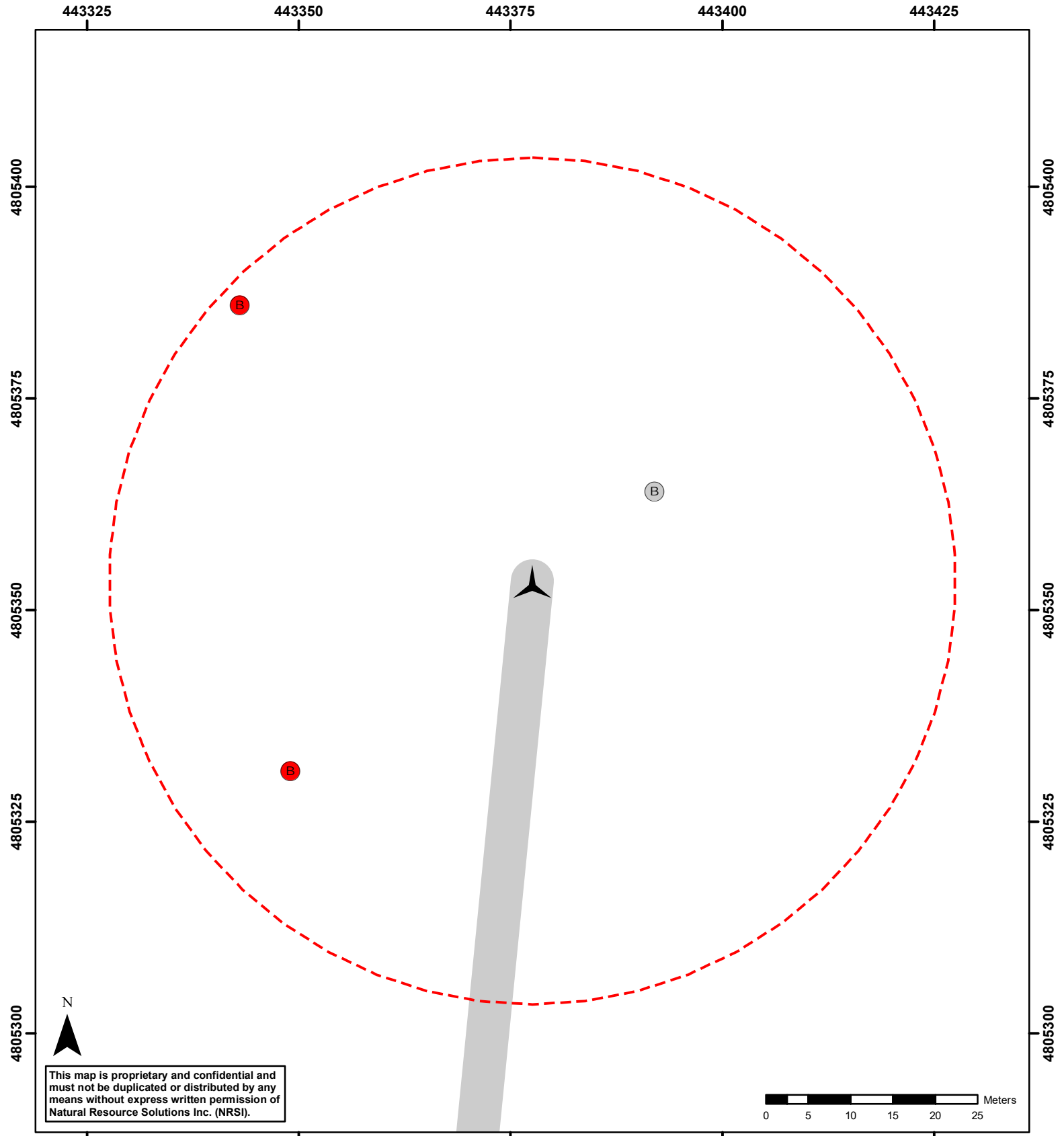
- Legend**
-  Turbine
  -  Search Radius (50m)
  -  Access Road

Appendix VI  
 Grand Bend  
 Wind Farm  
**Turbine T16 Mortalities 2022**

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

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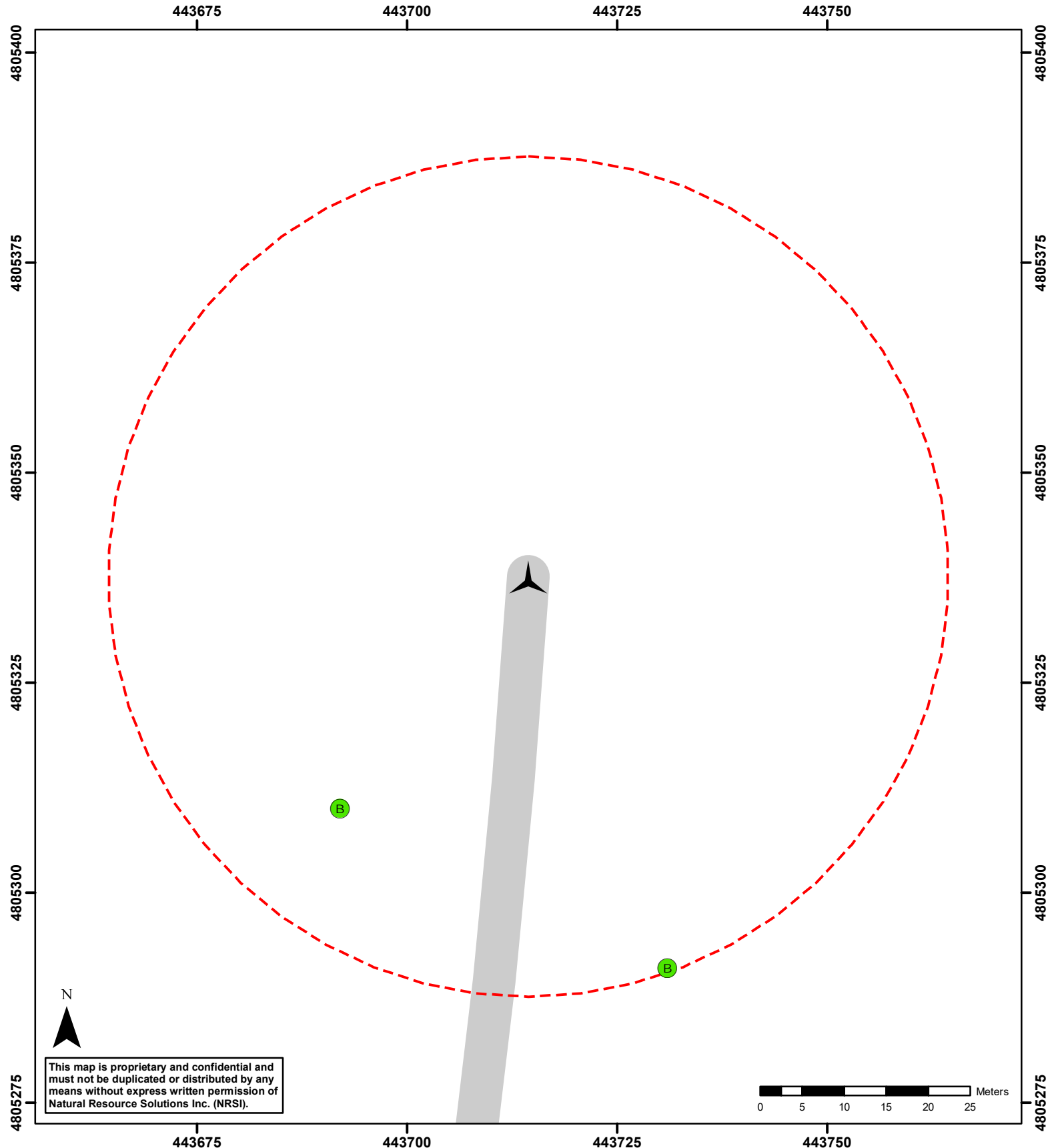
- Legend**
- Turbine
  - Search Radius (50m)
  - Access Road
  - Eastern Red Bat
  - Silver-haired Bat

Appendix VI  
 Grand Bend  
 Wind Farm  
**Turbine T17 Mortalities 2022**

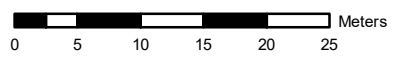
NAD83 - UTM Zone 17  
 Scale: 1:600 (8.5x11")





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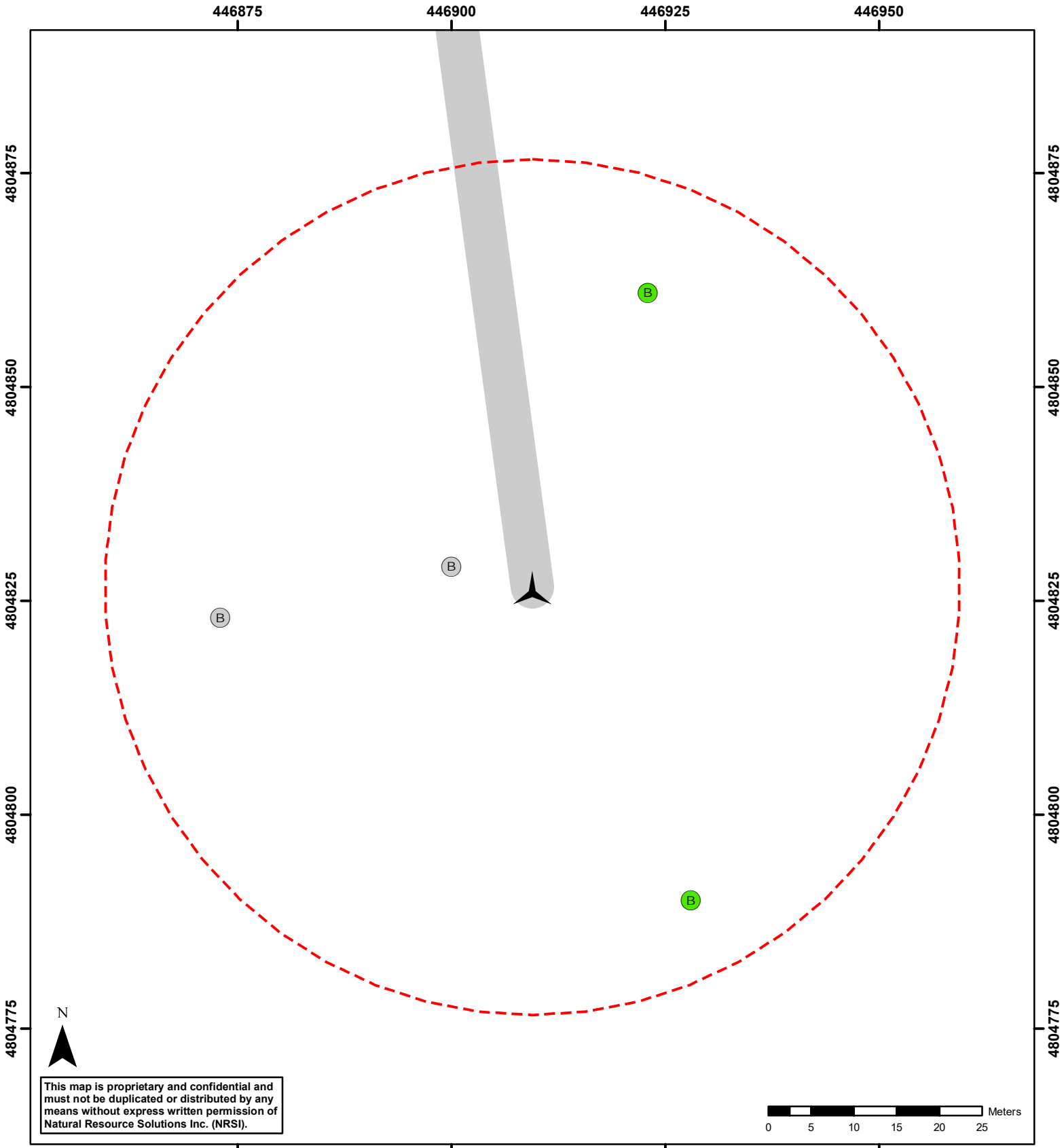
- Legend**
-  Turbine
  -  Hoary Bat
  -  Search Radius (50m)
  -  Access Road

Appendix VI  
 Grand Bend  
 Wind Farm  
**Turbine T18 Mortalities 2022**

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

Date: January 19, 2023  
 Project: 2408C





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

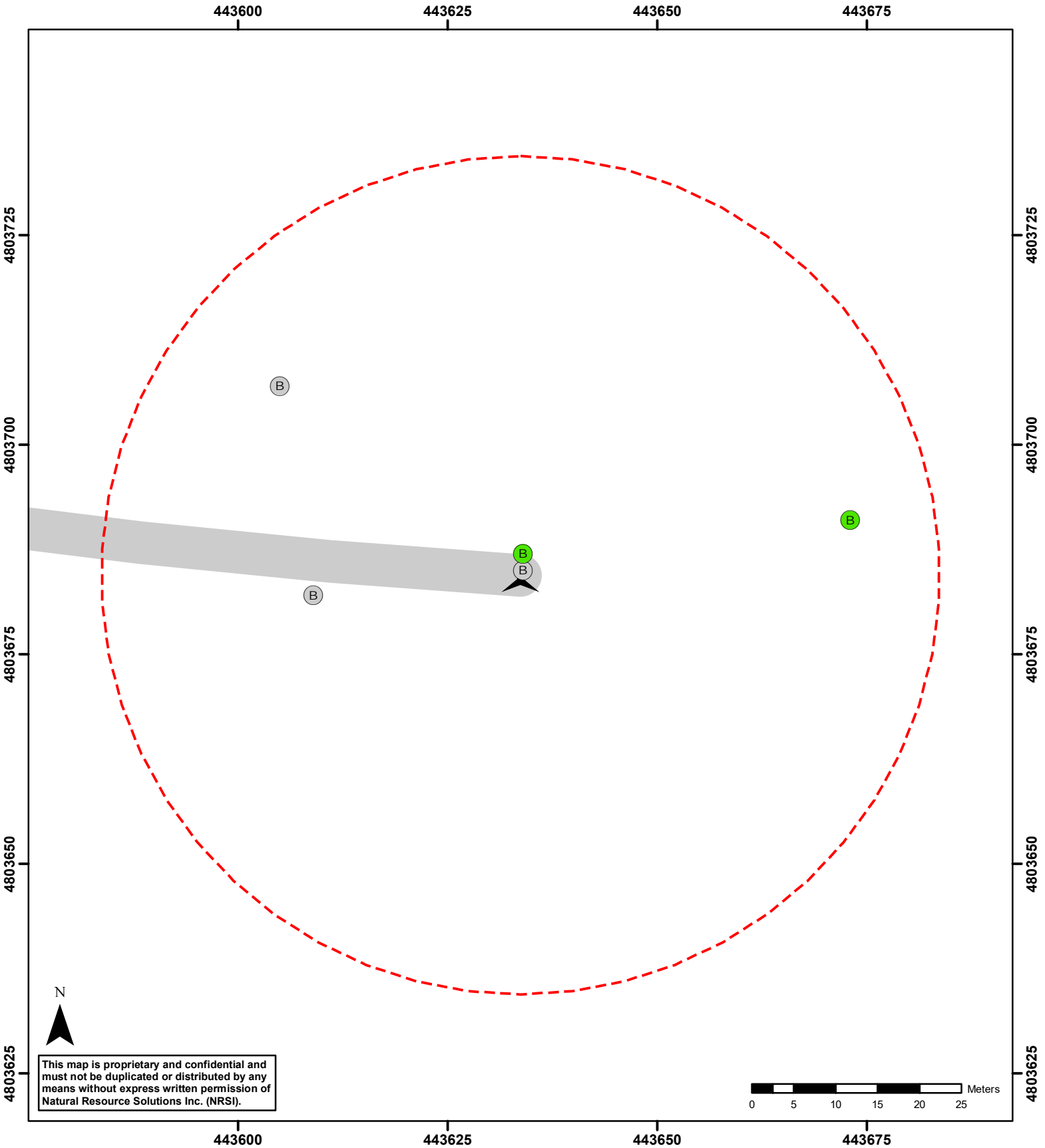
Appendix VI

**Grand Bend  
Wind Farm**

**Turbine T20 Mortalities 2022**

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 19, 2023 Project: 2408C
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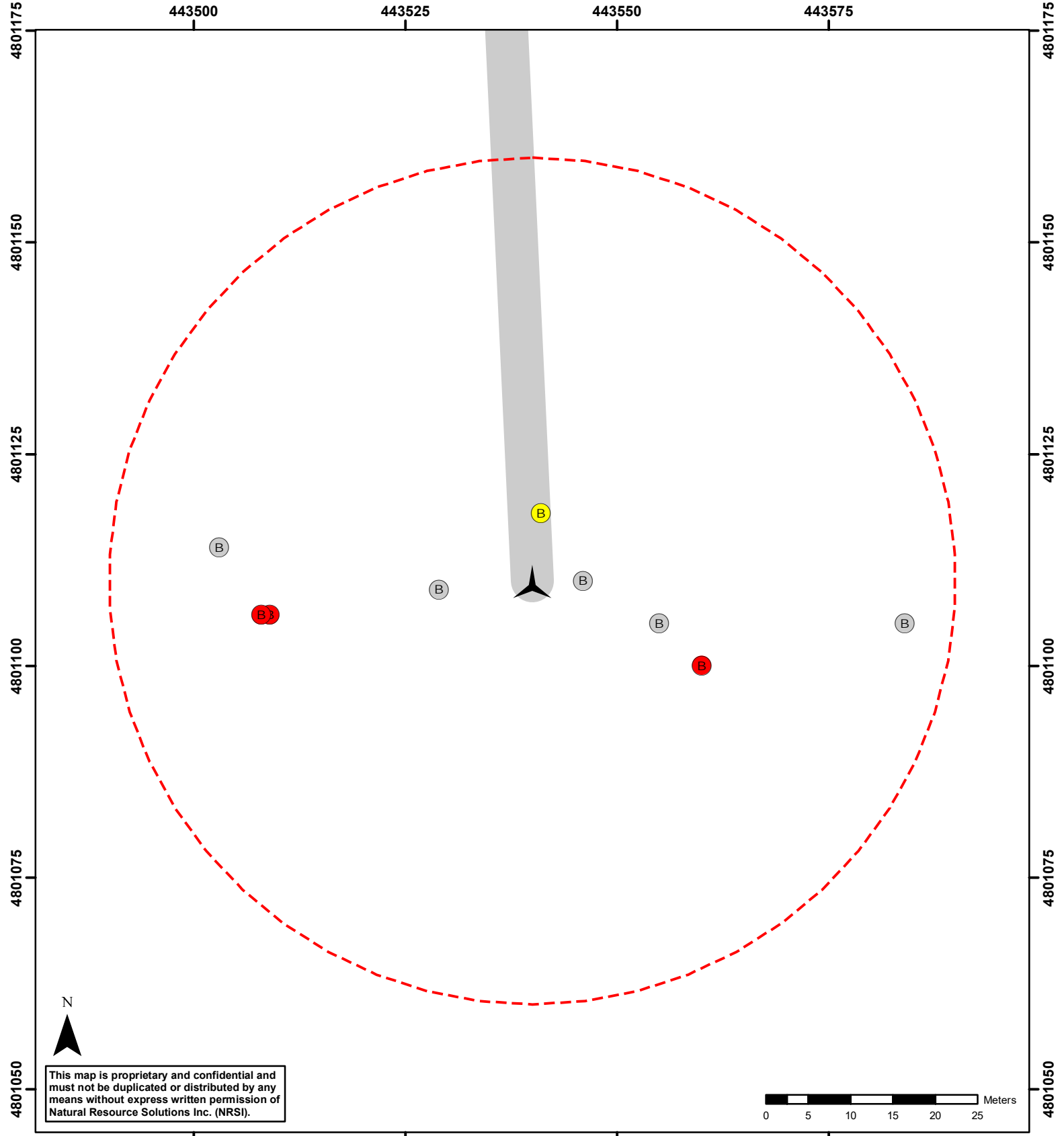
**NATURAL RESOURCE SOLUTIONS INC.**  
Aquatic, Terrestrial and Wetland Biologists



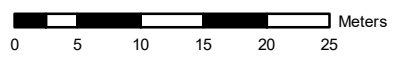
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<b>Legend</b> Turbine Search Radius (50m) Access Road		Hoary Bat Silver-haired Bat	
Appendix VI <b>Grand Bend Wind Farm</b> <b>Turbine T27 Mortalities 2022</b>		NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	
		Date: January 19, 2023 Project: 2408C	
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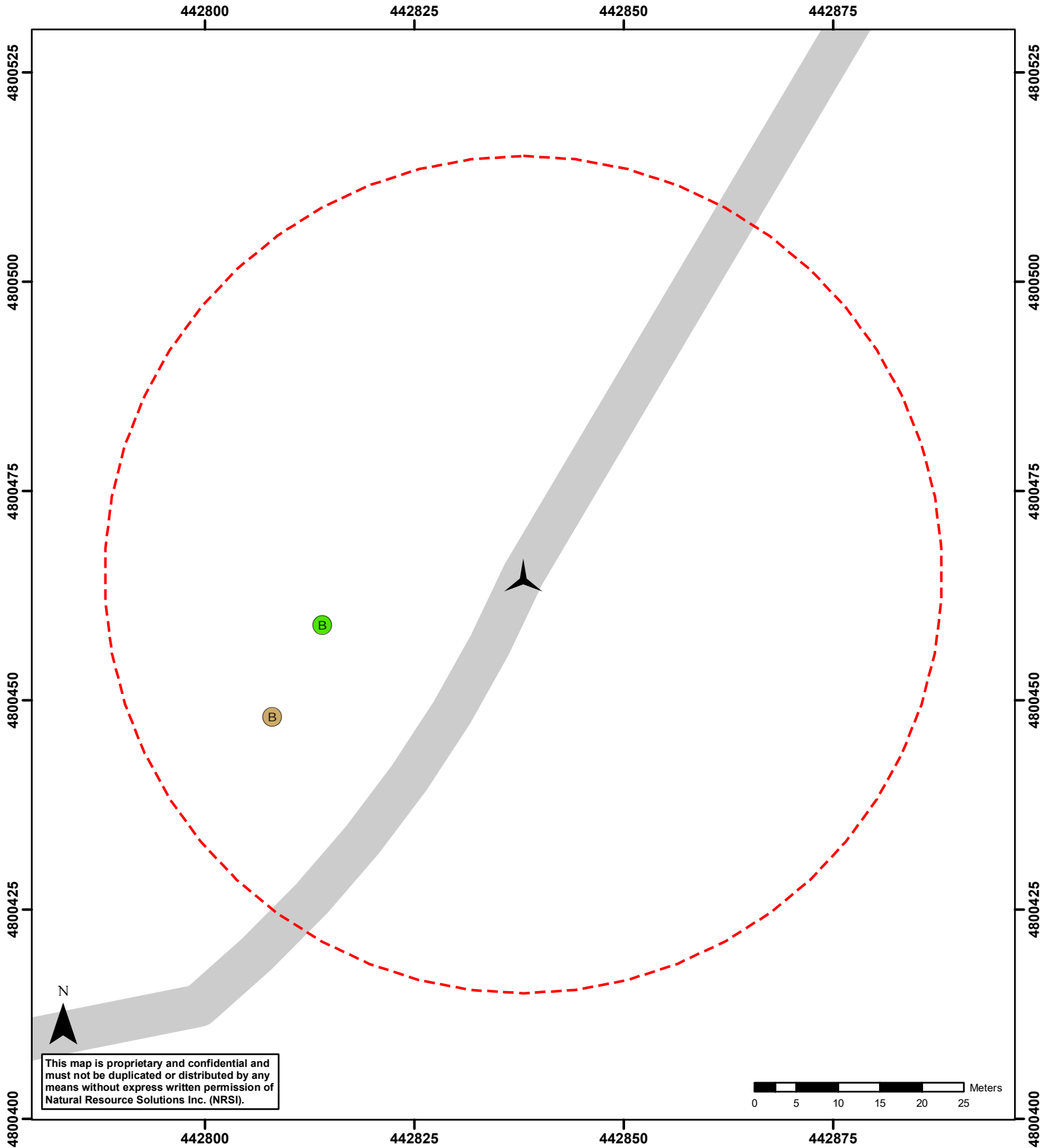


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<b>Legend</b> Turbine Search Radius (50m) Access Road Eastern Red Bat Little Brown Myotis Silver-haired Bat		Appendix VI <h3 style="text-align: center;">Grand Bend Wind Farm</h3> <h4 style="text-align: center;">Turbine T31 Mortalities 2022</h4>	
NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")		Date: January 19, 2023 Project: 2408C	
<b>NATURAL RESOURCE SOLUTIONS INC.</b> <small>Aquatic, Terrestrial and Wetland Biologists</small>			





**Legend**

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

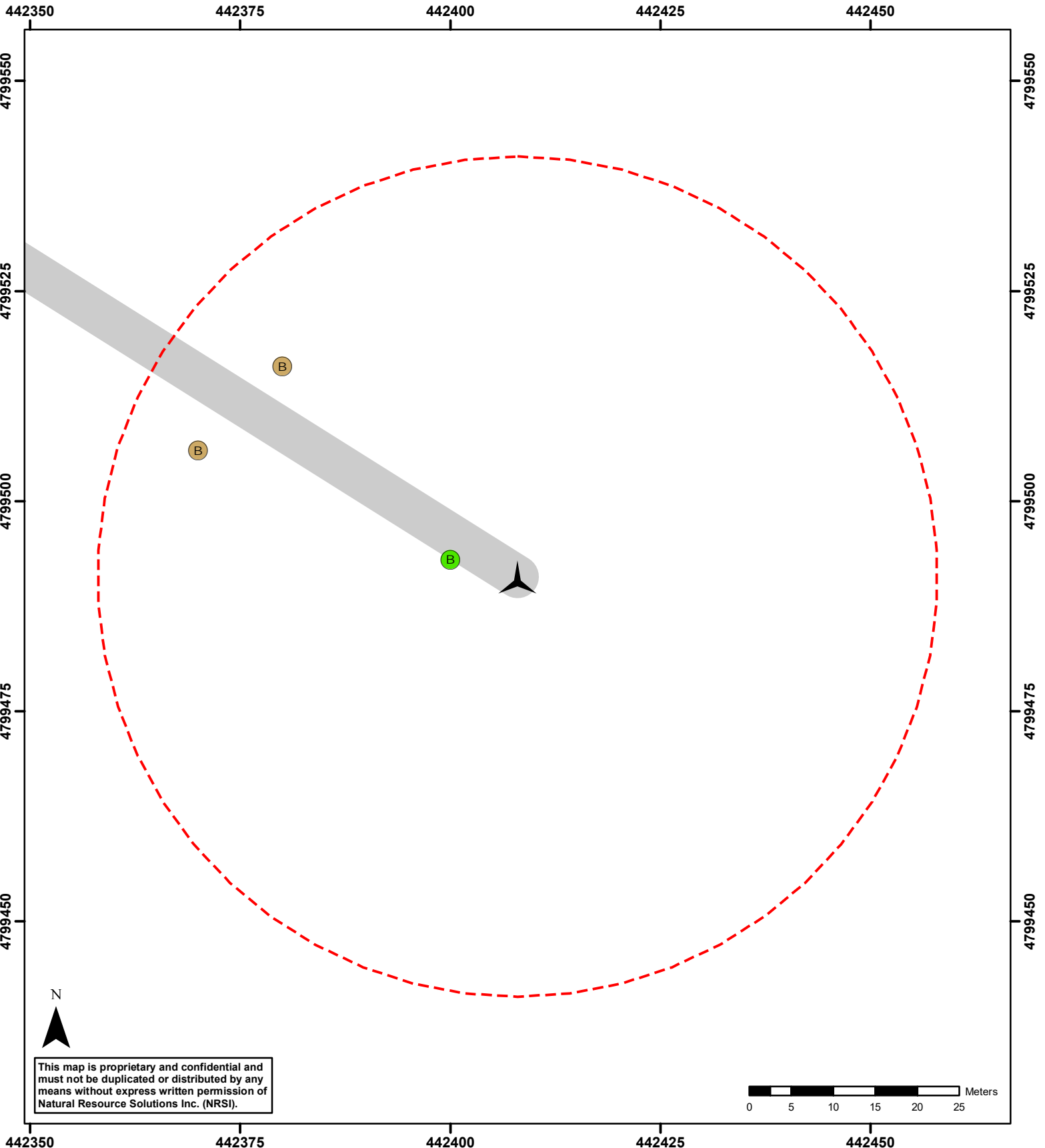
Appendix VI

**Grand Bend  
Wind Farm**

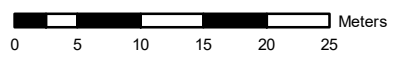
**Turbine T33 Mortalities 2022**

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 19, 2023 Project: 2408C
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**Legend**

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

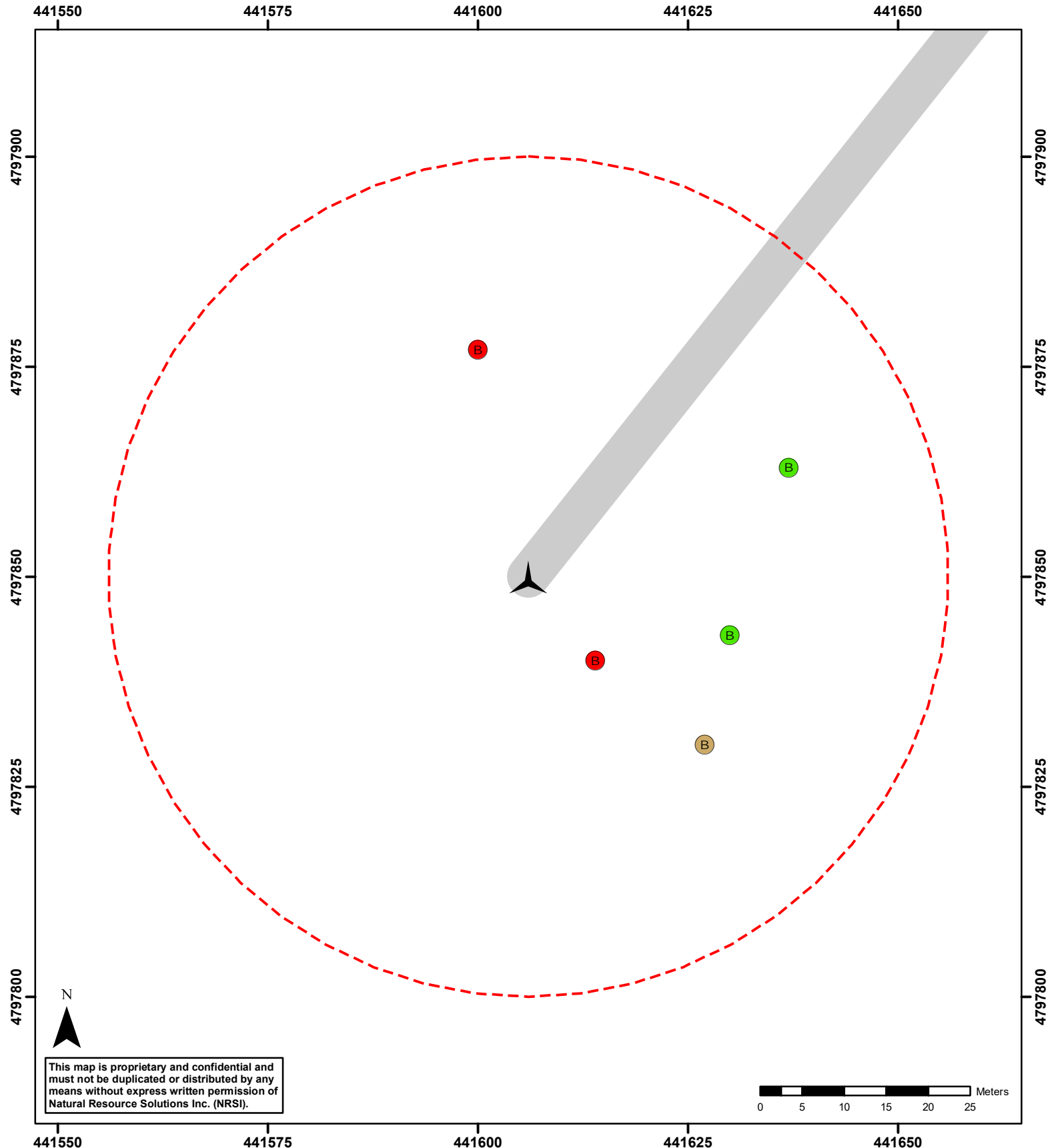
Appendix VI

**Grand Bend  
Wind Farm**

**Turbine T38 Mortalities 2022**

NAD83 - UTM Zone 17 Scale: 1:600 (8.5x11")	Date: January 19, 2023 Project: 2408C
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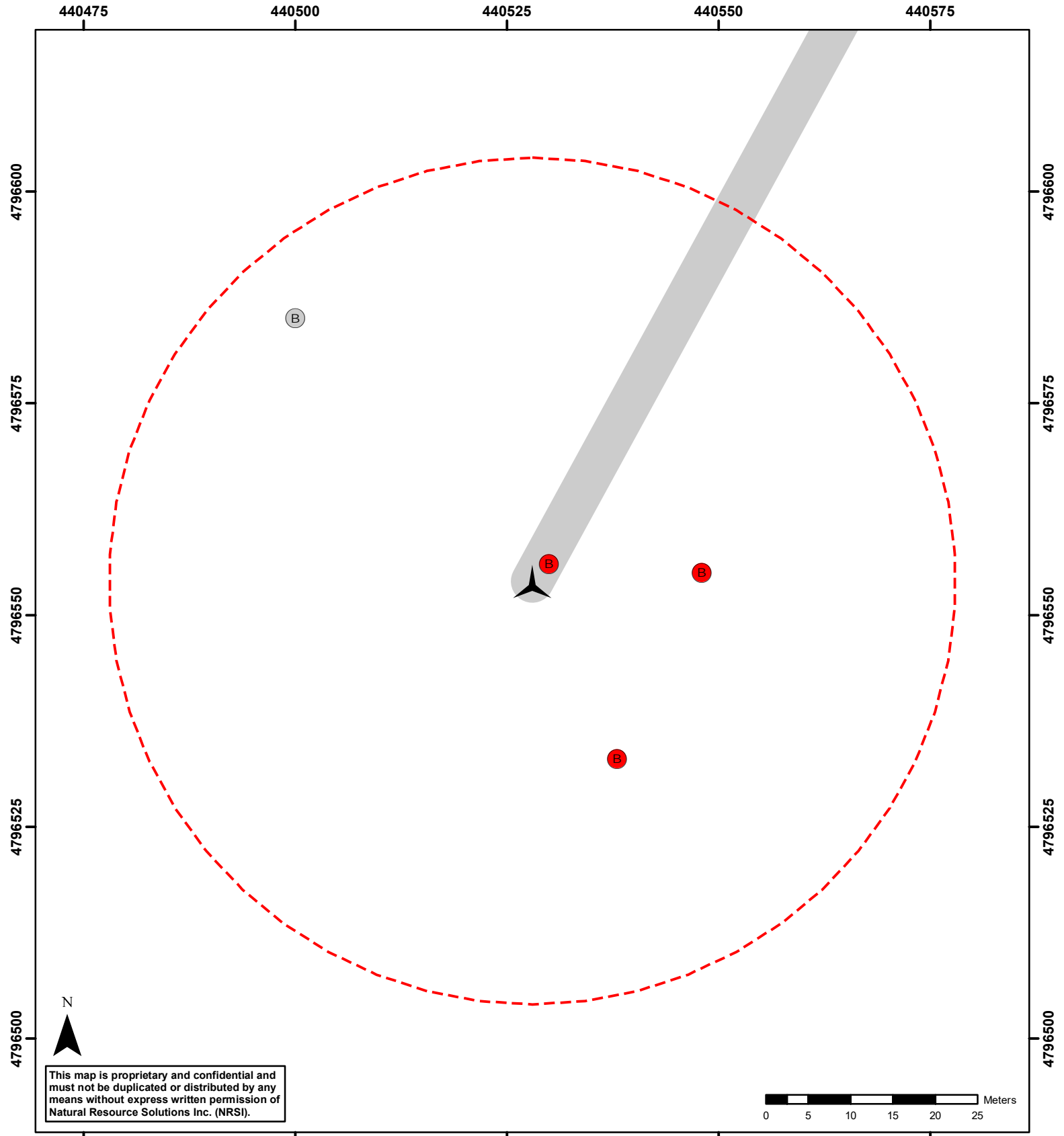
- Legend**
- Turbine
  - Search Radius (50m)
  - Access Road
  - Big Brown Bat
  - Eastern Red Bat
  - Hoary Bat

Appendix VI  
 Grand Bend  
 Wind Farm  
**Turbine T42 Mortalities 2022**

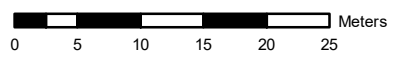
NAD83 - UTM Zone 17  
 Scale: 1:600 (8.5x11")

Date: January 19, 2023  
 Project: 2408C



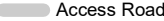






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**Legend**

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

Appendix VI  
 Grand Bend  
 Wind Farm  
**Turbine T48 Mortalities 2022**

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

Date: January 19, 2023  
 Project: 2408C

