

Amherst Island Wind Project **2020 Post-Construction Mortality Monitoring Report**

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Amherst Island Wind Project 2020 Post-Construction Mortality Monitoring Report

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Executive Summary

Natural Resource Solutions Inc. was retained to conduct three (3) years of postconstruction monitoring at the operational Amherst Island Wind Project, located in Loyalist Township, Lennox and Addington County, Ontario. This wind energy facility has a generating capacity of 74.3MW and consists of 26 turbines in an agricultural landscape dominated by pasture. Occasional wooded habitats, wetlands, and aquatic features are also present in the areas surrounding the project infrastructure. This report provides the detailed methods and results from the second year of post-construction monitoring for bird and bat mortality conducted at the Amherst Island Wind Project in 2020.

During twice weekly searches from May 1 to October 31, 2020, a total of 39 bird mortalities were documented within the search areas around the subset of 10 turbines. Observed bird mortalities consisted mostly of landbird species that are considered common in the province. Using correction factors for searcher efficiency, scavenger removal, and proportion of area searched, an estimated bird mortality rate of 8.14 birds/turbine/year (2.85 birds/MW/year) was determined for the Amherst Island Wind Project. This is below the provincial threshold of 14 birds/turbine/year. No significant bird mortality events were documented.

A total of three (3) raptor mortalities were documented in the search areas around the regularly searched turbines. Two (2) additional raptor mortalities were documented at once-monthly monitored turbines searched between May and October. Raptor mortalities were comprised of three (3) Turkey Vultures (*Cathartes aura*), one (1) Osprey (*Pandion haliaetus*), and one (1) Red-tailed Hawk (*Buteo jamaicensis*). The estimated raptor mortality rate for the Amherst Island Wind Project is 0.32 raptors/turbine/year (0.11 raptors/MW/year). This is above the provincial threshold of 0.2 raptors/turbine/year.

During twice weekly searches from May 1 to October 31, 2020, a total of 45 bat mortalities were documented within the search areas around the subset of 10 turbines. Bat mortalities of both 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 (3) species above are considered long-distance migratory species which over-winter outside of Ontario, and accounted for 73% of the total bat mortality observations at the Amherst Island Wind Project in 2020. Using correction factors for searcher efficiency, scavenger removal, and proportion of area searched, an estimated bat mortality rate of 10.15 bats/turbine/year (3.59 bats/MW/year) was determined for the Amherst Island Wind Project. This is above the provincial threshold of 10 bats/turbine/year.

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained to conduct the second year of postconstruction monitoring at the operational Amherst Island Wind Project (Amherst Island WP), located in Loyalist Township in Lennox and Addington County, Ontario. The Amherst Island WP consists of 26 wind energy generating turbines with a total nameplate capacity of 74.3MW. The project area and turbine locations can be seen on Map 1.

Post-construction mortality monitoring at the Amherst Island WP in 2020 included bird, raptor, and bat mortality monitoring, searcher efficiency trials, scavenger removal trials, and visibility class mapping of substrates searched. These surveys were conducted in accordance with provincial guidelines and project approval conditions to assess the potential impacts of this wind energy generating facility on local and migratory birds, raptors, and bats.

The purpose of this report is to provide the detailed methods and results from the second year of post-construction mortality monitoring conducted at the Amherst Island WP.

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

2.0 Mortality Monitoring Methodology

2.1 Mortality Monitoring

2.1.1 Sample Locations

Since the Amherst Island WP consists of more than10 turbines, a subset of at least 30% of turbines (minimum 10 turbines) is required to be monitored (OMNR 2011a, OMNR 2011b). In accordance with these requirements, a subset of 10 turbines (38.5%) were selected by Stantec Consulting Ltd. in consultation with the Ministry of Natural Resources and Forestry (Stantec 2013). However, one (1) of the subset turbines (S18) was damaged and not operational between November 2019 and early September 2020. As a result, turbine S26 replaced S18 in the subset of twice-weekly monitored turbines beginning on May 7, 2020. This substitution occurred in consultation with the MECP and MNRF (C. Raffael pers. comm.).

NRSI conducted mortality monitoring at the subset of 10 turbines in 2020, following the monitoring period and search frequency described below. The subset of turbines that were monitored at the Amherst Island WP in 2020 is shown on Map 1.

2.1.2 Monitoring Period and Search Frequency

NRSI biologists conducted twice weekly (three (3) and four (4) day intervals) mortality monitoring for birds and bats at the subset of 10 turbines during the entire monitoring period of May 1 to October 31, 2020. For the purposes of this monitoring program, searches in May and June are considered to have been completed in Spring, July and August in Summer, and September and October in Fall.

Mortality monitoring specific to raptors occurred for the full duration of the year, as follows:

- Once weekly at all 26 turbines in January, February, and March (Winter 1),
- Once weekly at the 10 subset turbines in April (Winter 1),
- Twice weekly (three (3) and four (4) day intervals) at the 10 subset turbines in May through October (Spring, Summer, and Fall, as defined above),
- Once weekly at the 10 subset turbines in November (Winter 2), and
- Once weekly at all 26 turbines in December (Winter 2).

In addition, raptor mortality monitoring was conducted once per month from May to November (inclusive) at the remaining 16 turbines.

As a result of turbine maintenance, inclement weather or other safety concerns, some turbines could not be searched on particular scheduled dates. This relatively minor adjustment to the monitoring protocol is not expected to impact the results or conclusions presented in this report. The dates when turbines were not able to be searched are listed in Table 1.

Date (2020)	Date Turbine Next Searched (2020) ¹	Turbine(s)	Rationale
January 30	February 6	S01, S29	Turbine Maintenance
April 9	April 14	S01, S02, S03, S05, S07, S14, S18, S22, S28, S26	Transportation Issue
June ²	July 14	S18	Turbine Repair
July 16	July 20	S28, S26	Inclement Weather (Lightning)
October 22	October 26	S26	Health & Safety Concern (Aggressive dogs)

 Table 1. Summary of Regular Search Days When Turbines Could Not Be Searched (2020)

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

² This once-monthly search of turbine S18 was unable to be performed as a result of turbine repair activities.

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 5m apart. Any mortality that was incidentally observed beyond the formal search parameters was still documented, photographed, and collected, but is not included in formal calculations of estimated mortality rates and is not discussed further in this report. In order to maintain a consistent search effort, mortality searches followed a consistent search time throughout each month of searching. When searching all 26 turbines during January to March and December for raptor mortalities, a search time of 20 minutes per turbine was used. At the subset of 10 turbines, a search time of 20 minutes per turbine was used during the months of April and November for raptor mortalities, and 30 minutes per turbine during the months of May to October for bat, bird and raptor mortalities. At the remaining 16 turbines, a search time of 20 minutes per turbine was used during the month of November for raptor mortalities.

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 has been provided in Appendix I.

In addition to general information collected on each visit, a variety of specific information was recorded upon encountering any mortality. This detailed information collected for each mortality, 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, direction and distance from turbine base, substrate type and visibility class, and a unique mortality identification number for future reference. Specific UTM coordinates and photographs were also taken for each specimen to allow for further analysis, if necessary.

2.2 Scavenger Removal Trials

As per the *Environmental Effects Monitoring Plan for Wildlife* (EEMP, Stantec 2013) carcasses for small birds, bats and raptors were used for scavenger removal trials to determine scavenging rate. Carcasses of small birds and bats were combined into one trial applicable to both. A separate trial was conducted for raptor carcasses. Due to the difficulty in obtaining a sufficient number of fresh raptor carcasses, waterfowl and Common Raven (*Corvus corax*) carcasses were occasionally used in place of raptors as they represent similarly-sized surrogates. These minor substitutions are not expected to have a material result on the annual corrected mortality rate for raptors. The monitoring program for each trial type (small birds/bats and raptors) are detailed in the sections below.

2.2.1 Small Birds and Bats

Scavenger removal trials for small birds and bats were conducted in each of the Spring, Summer, and Fall seasons of mortality monitoring. A minimum of 10 carcasses were placed in each monitoring season. No more than five (5) carcasses were placed at one time. Carcasses were placed throughout the range of habitats and substrate types being searched during each season. Species, UTM coordinates, direction and distance from turbine base, substrate, and visibility class were all noted on a data sheet during the placement of each specimen. The scavenger removal data sheet has been provided in Appendix I.

Carcasses placed included both small bird and bat specimens, with each trial consisting of at least one-third representation of each of bird and bat carcasses. Small bird carcasses included species commonly encountered in this region of the province and ranged in size from very small to moderate-sized carcasses. 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 has been provided in Appendix II.

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

2.2.2 Raptors

Scavenger removal trials for raptors were conducted in three (3) grouped seasons: a) Winter 1, from January through April; b) combined Spring/Summer/Fall, from May through October; and c) Winter 2, November and December. A minimum of 10 carcasses were placed in each monitoring season as defined above, with the exception of Winter 2. For the Winter 2 SC trails, a sufficient quantity of fresh large bird carcasses was unavailable for the full season, therefore only three (3) carcasses were placed. Given the short duration of the Winter 2 season, this avoids bias in the trial resulting from saturation of large carcasses being available to scavengers. This same rationale was used to combine the Spring/Summer/Fall seasons for the raptor scavenger removal trial, particularly given that large bird mortality rates are typically low and thus the availability of large bird carcasses on the landscape would typically be low.

No more than two (2) raptor carcasses were placed at one time, and no more than two (2) carcasses were placed at any single turbine during each seasonal trial. These measures were also taken to avoid bias in the trial resulting from saturation of carcasses available to scavengers. Carcasses were placed throughout the range of habitats and substrate types being searched during each season. Species, UTM coordinates, direction and distance from turbine base, substrate, and visibility class were all noted on a data sheet during the placement of each specimen. The scavenger removal data sheet has been provided in Appendix I. A list of the large bird species used during scavenger removal trials has been provided in Appendix II.

During each scavenger removal trial, the large bird carcasses were left for up to four (4) search events during each season (four (4) weeks in Winter 1 and Winter 2, and 14 days in the Spring/Summer/Fall). Carcasses were checked at the same frequency as mortality searches, or approximately once per week in the Winter seasons and twice per week in the Spring/Summer/Fall season, to note any scavenging or signs of scavenger presence.

2.3 Searcher Efficiency Trials

In conjunction with mortality searches, NRSI conducted searcher efficiency trials on staff that conducted mortality searches at the Amherst Island WP. Similar to scavenger removal trials, searcher efficiency trials must be conducted at least once per season (Spring, Summer, and Fall), and on each searcher and in each visibility class that was searched during that season. In order to obtain more accurate results and to account for seasonal changes in groundcover, weather, or soil saturation, NRSI conducted monthly searcher efficiency trials from May to October. In accordance with the EEMP (Stantec 2013), searcher efficiency trials were not conducted for raptor mortalities, as large birds are highly visible and searcher efficiency results would be expected to approach very closely to 1.0, if not 1.0 itself.

During each trial, searchers were tested without their knowledge through the placement of a minimum of 10 test carcasses per visibility class searched by the searcher, with no more than three (3) carcasses placed on any one date. In one instance, the searcher was tested with nine (9) carcasses in one visibility class searched and 11 carcasses in the other visibility class searched, instead of 10 in each. In the summer season, one of the searchers was not able to be tested with 10 carcasses in each visibility class due to the number of their search days being less than the number of days required for a full trial sample, considering that no more than three (3) carcasses can be placed on any one search date. Therefore, the searcher was tested on each day they searched (May 28 to July 9), with results combined and considered to represent the searcher's efficiency for the duration of that period, and is applicable to their searches in both the Spring and Summer seasons. These very minor deviations are not expected to have any material result on the annual corrected mortality rate for birds or bats.

Carcasses were placed randomly within the search radius throughout the subset of 10 turbines at the Amherst Island WP. Distance and direction from turbine base, visibility class and substrate type, and UTM coordinates were recorded for each test carcass placed. Trial carcasses were unmarked to avoid introducing bias by alerting the searcher to the trial. Each found specimen was later compared to the total number of carcasses placed within the project area and the locations of their placement. The data sheet used for searcher efficiency trials has been provided in Appendix I.

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

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

2.4 Proportion of Area Searched

Following Ministry of Natural Resources and Forestry (MNRF) guidelines, visibility class maps were completed by searchers at a minimum frequency of once per season (OMNR 2011a, OMNR 2011b). Due to the potential for changing conditions, NRSI completed visibility class maps once per month from May to October to provide additional information to increase the accuracy of the estimated mortality rates. Visibility class maps were completed once per season in each of Winter 1 and Winter 2 due to the lack of vegetation growth and relatively consistent search substrates.

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

In order to help increase the accuracy of searcher efficiency rates and minimize the influence of the proportion of area searched on the bird and bat mortality estimates, the

majority of the search radii at the subset of 10 turbines were maintained at visibility class 1 and 2 through occasional mowing, as needed, for the duration of the growing season (May through October), wherever possible. Small areas of other visibility classes were present, such as in hedgerows. When small and temporary areas of other visibility classes were present, they were searched thoroughly until scheduled vegetation maintenance could occur. As a result, the majority of the 50m radius at each turbine was searched for the duration of the 2020 monitoring period. Some areas were determined to be visibility classes that were not searched as part of this monitoring program (i.e. visibility classes 3 and 4). In these cases, the appropriate proportion of area searched was calculated and used for final mortality estimates. Visibility class maps of each turbine in each month are provided in Appendix VII.

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

3.0 Scavenger Removal Trial Results

Scavenging activity at the Amherst Island WP was generally moderate to high throughout the monitoring seasons for small birds and bats, with low scavenging activity noted in Winters1 and 2, specific to raptors. Details on the date placed, species, distance and direction from turbine, visibility class, dates checked and by whom, UTM coordinates, and whether the carcass was scavenged have been provided in Appendix II.

3.1 Small Birds and Bats

Table 2 shows the results from the seasonal scavenger removal trials conducted for small birds and bats at the Amherst Island WP.

Number of Carcasses Remaining							
Spring Trial (May/June)							
Turbine	Visit 0	Visit 1	Visit 2	Visit 3	Visit 4		
S01	1	1	1	0	0		
S02	1	1	1	0	0		
S03	1	0	0	0	0		
S05	1	1	1	1	1		
S07	1	0	0	0	0		
S14	1	1	0	0	0		
S22	1	1	1	0	0		
S26	1	1	1	1	0		
S28	1	1	1	0	0		
S36	1	0	0	0	0		
Total	10	7	6	2	1		
Summer 1	Frial (July/A	ugust)	-	-	-		
Turbine	Visit 0	Visit 1	Visit 2	Visit 3	Visit 4		
S01	2	0	0	0	0		
S02	1	0	0	0	0		
S03	1	0	0	0	0		
S05	3	3	1	0	0		
S07	3	3	1	1	1		
S14	1	0	0	0	0		
S22	2	0	0	0	0		
S26	2	1	0	0	0		
S28	2	0	0	0	0		

Table 2. Number of Carcasses Remaining During Scavenger Removal Trials for SmallBirds and Bats at the Amherst Island WP (2020)

Number of Carcasses Remaining							
S36	3	3	1	0	0		
Total	20	10	3	1	1		
Fall Trial (September/	October)					
Turbine	Visit 0	Visit 1	Visit 2	Visit 3	Visit 4		
S01	1	0	0	0	0		
S02	2	1	1	1	1		
S03	1	1	1	1	1		
S05	2	1	1	1	1		
S07	2	1	1	1	1		
S14	1	0	0	0	0		
S22	1	1	0	0	0		
S26	0	0	0	0	0		
S28	3	0	0	0	0		
S36	2	1	0	0	0		
Total	15	6	4	4	4		

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

 $\begin{aligned} Sc &= \frac{n_{visit1} + n_{visit2} + n_{visit3} \dots}{n_{visit0} + n_{visit1} + n_{visit2} \dots} \end{aligned}$

Sc: proportion of carcasses not removed by scavengers n_{visit0} : total number of carcasses placed $n_{visit1} - n_{visit3}$...: numbers of carcasses remaining on visits 1 through 3 etc.

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

Sc _{Spring}	= (7 + 6 + 2 + 1) / (10 + 7 + 6 + 2) = 16 / 25 = 0.64
Sc _{Summer}	= (10 + 3 + 1 + 1) / (20 + 10 + 3 + 1) = 15 / 34 = 0.44
Sc _{Fall}	= (6 + 4 + 4 + 4) / (15 + 6 + 4 + 4) = 18 / 29 = 0.62

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

3.2 Raptors

Table 3 shows the results from the seasonal scavenger removal trials conducted for raptors at the Amherst Island WP.

M	Number	of Carca	sses Ren	naining				
winter 1 Trial (January-April)								
Turbine	Visit 0	Visit 1	Visit 2	Visit 3	Visit 4			
S13	1	1	1	1	1			
S20	1	1	1	1	1			
S21	1	1	1	1	1			
S30	1	1	1	1	1			
S31	1	0	0	0	0			
S37	1	1	1	1	1			
Total	6	5	5	5	5			
Spring/Sur	nmer/Fall	Trial (May	-October)					
Turbine	Visit 0	Visit 1	Visit 2	Visit 3	Visit 4			
S01	1	1	1	0	0			
S02	1	1	1	1	1			
S03	1	1	1	1	1			
S05	2	2	2	2	2			
S07	1	1	1	1	0			
S14	2	2	2	2	2			
S22	2	2	2	2	2			
S26	1	1	0	0	0			
S28	1	0	0	0	0			
Total	12	11	10	9	8			
Winter 2 Tr	ial (Nove	mber-Dec	ember)					
Turbine	Visit 0	Visit 1	Visit 2	Visit 3	Visit 4			
S05	1	1	1	1	1			
S28	1	1	1	1	1			
S18	1	1	1	1	1			

3

3

3

Table 3. Number of Carcasses Remaining During Scavenger Removal Trials for Raptors at the Amherst Island WP (2020)

3

3

Total

Using the scavenger removal results presented in Table 3, and the equation provided by the MNRF, the seasonal scavenger removal rates for raptors have been determined as follows:

SC _{Winter1}	= (5 + 5 + 5 + 5) / (6 + 5 + 5 + 5) = 20 / 21 = 0.95
SC _{Spring} / Summer/Fall	= (11 + 10 + 9 + 8) / (12 + 11 + 10 + 9) = 38 / 42 = 0.90
Sc _{Winter2}	= (3 + 3 + 3 + 3) / (3 + 3 + 3 + 3) = 12 / 12 = 1.00

The above scavenger removal rates represent the proportion of raptor carcasses still remaining from one visit to the next. These values generally represent low scavenging activity for raptors throughout the year, with further decreases in activity in both winters. The above raptor scavenging removal rates will be used to calculate the estimated raptor mortality rates in Section 7.0.

4.0 Searcher Efficiency Trial Results

Searcher efficiency rates at the Amherst Island WP during the 2020 monitoring season were high in each of the Spring, Summer, and Fall. Results of the monthly searcher efficiency trials are summarized in Table 4. Details on the searcher and tester, species, distance and direction from turbine, habitat, substrate, visibility class, UTM coordinates, and whether the carcass was found or scavenged have been provided in Appendix III.

Searcher	Carcasses Found	Carcasses Placed	Carcasses Scavenged	Searcher Efficiency	Proportion of Turbines Searched	
Spring 2020	-					
Searcher A	17	20	0	0.85	0.68	
Searcher B ¹	N/A	N/A	N/A	0.90	0.03	
Searcher C ²	36	39	1	0.95	0.29	
Summer 2020						
Searcher A	18	22	2	0.90	0.80	
Searcher C ²	36	39	1	0.95	0.09	
Searcher D ¹	N/A	N/A	N/A	0.93	0.11	
Fall 2020						
Searcher A	18	23	3	0.90	0.94	
Searcher E ¹	N/A	N/A	N/A	0.90	0.06	

Table 4. Results of Searcher Efficiency Trials at the Amherst Island WP (2020)

¹ These searchers searched on no more than two (2) dates in the identified season and therefore could not be properly tested for searcher efficiency following MNRF guidelines (i.e. seven (7) search days are required for proper testing in two (2) visibility classes as no more than three (3) carcasses can be placed at a time). In these circumstances, the average result obtained by the other regular searchers in each month was used for these searchers.

² This searcher completed searches between May 28 and July 9. As they could not be properly tested for searcher efficiency in the Summer season following MNRF guidelines as described above, this searcher was tested on every search date and the resulting combined value used for this searcher in both the Spring and Summer seasons.

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

So -	number of test carcasses found			
$Se = \frac{1}{1}$ number of test carcasses placed – number of carcasses scavenged				
SeO =	= Se _A (proportion of turbines searched) + Se _B (proportion of turbines searched)			

$$\begin{split} & \text{SeO}_{\text{Spring}} &= 0.85 \ (0.68) + 0.90 \ (0.03) + 0.95 \ (0.29) = \textbf{0.88} \\ & \text{SeO}_{\text{Summer}} &= 0.90 \ (0.80) + 0.95 \ (0.09) + 0.93 \ (0.11) = \textbf{0.91} \\ & \text{SeO}_{\text{Fall}} &= 0.90 \ (0.94) + 0.90 \ (0.06) = \textbf{0.90} \end{split}$$

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

5.0 Proportion of Area Searched

Visibility class mapping was completed every month from May to October within the 50m search radius of each of the 10 subset turbines in order to reflect any changes in groundcover and resulting visibility classes. In addition, visibility class mapping was completed as often as necessary in the winter months to characterize the remaining turbines in the project which contributed to the estimate of raptor mortality, resulting in mapping completed once in Winter 1 and once in Winter 2 for all turbines. All visibility class maps have been provided in Appendix VII.

Visibility class mapping was used in combination with GIS software to determine the specific area and sizes of each of the applicable visibility classes identified with the turbine search areas. During the 2020 monitoring program, NRSI biologists searched all areas of visibility class 1 and 2 during the months of May through November, which is reflected in the proportion of area searched (Ps) calculated for all 10 turbines during each of those monitoring months, as shown in Table 5. During the winter months, all visibility classes were searched, with the exception of some unsearchable areas including woodlands, watercourses or other large obstacles. These values will be used to calculate the estimated avian, raptor and bat mortality rates in Sections 6.0, 7.0, and 8.0, respectively.

Month	Total Searched Area (m²)	Number of Turbines Searched Regularly	Total Search Radius (m²)	Proportion of Area Searched (Ps)
January	204,100	26	204,100	1.00
February	204,100	26	204,100	1.00
March	204,100	26	204,100	1.00
April	78,500	10	78,500	1.00
May	71,172	10	78,500	0.91
June	77,807	10	78,500	0.99
July	78,391	10	78,500	1.00
August	78,391	10	78,500	1.00
September	78,391	10	78,500	1.00
October	78,391	10	78,500	1.00
November	78,500	10	78,500	1.00
December	204,100	26	204,100	1.00

Table 5. Proportion of	Area Searched at t	he Amherst Island	WP (2020)
			· · · · · · · · · · · · · · · · · · ·

6.0 Avian Mortality Results

6.1 Avian Mortalities

During the 2020 mortality monitoring period at the Amherst Island WP, NRSI biologists found 39 bird mortalities within the 50m radius of the monitoring subset of 10 turbines between May and October. The majority of the mortalities that could be identified to the species level were confirmed to be small landbirds, generally representing a variety of common species for this area of the province. The most commonly observed mortalities were of Tree Swallow (*Tachycineta bicolor*, n=8) and Golden-crowned Kinglet (*Regulus satrapa*; n=6). Three (3) bird mortalities could not be identified to the species level due to advanced decomposition and/or scavenging activity, but were identified as passerine species (i.e. non-raptors).

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

6.2 Temporal Distribution of Avian Mortalities

Bird mortalities were generally observed throughout the year, although the greatest number of mortalities (n=15) was observed in the summer (July/August), with the greatest number of mortalities specifically documented in July and October (n=8 each). The distribution of avian mortalities by date can be seen in Figure 1.



Figure 1. Bird Mortalities Observed by Date at the Amherst Island WP (2020)

6.3 Spatial Distribution of Avian Mortalities

Avian mortalities were observed at eight (8) of the 10 subset turbines and varied in distribution across turbines overall (see Figure 2 below). No bird mortalities were observed at turbines S01 and S07. Mortalities at the remaining eight (8) turbines ranged from three (3) mortalities at multiple turbines to nine (9) at S02. Details regarding each avian mortality, including date, time, location, and species, are summarized in Appendix IV and turbine maps identifying the location of each observed mortality have been provided in Appendix VI.



Figure 2. Bird Mortalities Observed by Turbine at the Amherst Island WP (2020)

6.4 Corrected (Estimated) Avian Mortality

In accordance with the *Bird and Bird Habitats: Guidelines for Wind Power Projects* (OMNR 2011b), estimated avian mortality rates have been presented by individual turbines or turbine group. Since searcher efficiency and scavenger removal rates have been collected specifically for the 10-turbine subset for birds, NRSI is presenting estimated mortality rates by this same turbine group.

Based on the field observations at the Amherst Island WP, NRSI biologists have compiled the searcher efficiency trial results, scavenger removal trial results, proportion of area searched, and direct mortality observations into an equation that will be used to estimate the total avian mortality at the Amherst Island WP in 2020. The equation recommended by the MNRF is found below:

C = c / (Se*Sc*Ps)

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

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

C _{May}	= 5 / (0.88*0.64*0.91) = 5 / 0.5125 = 9.75 birds = 0.98 birds/turbine (0.34 birds/MW)
C _{June}	= 6 / (0.88*0.64*0.99) = 6 / 0.5576 = 10.76 birds = 1.08 birds/turbine (0.38 birds/MW)
C _{July}	= 8 / (0.91*0.44*1.00) = 8 / 0.4004 = 19.98 birds = 2.00 birds/turbine (0.70 birds/MW)
C_{August}	= 7 / (0.91*0.44*1.00) = 7 / 0.4004 = 17.48 birds = 1.75 birds/turbine (0.61 birds/MW)
C _{September}	= 5 / (0.9*0.62*1.00) = 5 / 0.5580 = 8.96 birds = 0.90 birds/turbine (0.31 birds/MW)
C _{October}	= 8 / (0.9*0.62*1.00) = 8 / 0.5580 = 14.34 birds = 1.43 birds/turbine (0.50 birds/MW)

Using the appropriate variables and equations recommended by the MNRF, the corrected (estimated) avian mortality at the Amherst Island WP in 2020 was calculated. Table 6 shows the monthly estimated mortality rates as well as the overall estimated avian mortality rate at the Amherst Island WP, as calculated by turbine group.

Month (2020)	Observed Avian Mortalities	Corrected Mortality (birds/turbine)	Corrected Mortality (birds/MW)
Мау	5	0.98	0.34
June	6	1.08	0.38
July	8	2.00	0.70
August	7	1.75	0.61
September	5	0.90	0.31
October	8	1.43	0.51
TOTAL	39	8.14	2.85

Table 6. Correc	ted Bird Mortality F	Rates Based on	Mortality Monito	ring at the Amherst
Island WP (202	0)		-	-

Based on the information collected during the 2020 post-construction monitoring period, the anticipated impact of this facility on birds is characterized by an estimated mortality rate of **8.14 birds/turbine/year** (2.85 birds/MW/year), as calculated by turbine group.

6.5 Mortalities Documented Near Significant Bird Habitats

Based on the proximity of the project to several significant bird habitats, additional consideration is required for turbines within 120m of any significant bird habitat to evaluate potential effects to nearby habitats. Table 7 below outlines the turbines located within 120m of significant bird habitats, the number of total bird mortalities documented at those turbines, and the total number of habitat-specific bird mortalities documented. Bird Significant Wildlife Habitats within 120m of the Amherst Island WP are shown on Map 2.

Habitat Name	Turbines Within 120m ¹	Total Bird Mortalities	Target Bird Mortalities ²			
Landbird Migr Migratory	Landbird Migratory Stopover Area Migratory Songbirds and Raptors, April-May, August-October					
ML1	S03 , S09	9	4			
ML2	S05	3	1			
ML3	S36	9	5			
ML4	S02, S07, S14, S26, S18	19	8			
ML5	S26	5	0			
Marsh Bird Br Marsh Bird	eeding Habitat Indicator Species, May-June					
MBB1	S36	9	0			
Woodland Area-sensitive Bird Breeding Habitat Woodland Area-sensitive Indicator Species, Breeding Bird Period, Late May – Early July						
ABB1	S03 , S09	9	1			
Open Country Bird Breeding Habitat Open Country Indicator Species, Breeding Bird Period, Late May – Early July						
OCB2	S03 , S05 , S09, S11, S16, S20, S34	15	0			
OCB3	S01 , S22 , S04, S29, S31	6	0			
OCB4	S31	1	0			
OCB5	S36 , S19, S21, S37	12	0			
OCB6	S02 , S07 , S14 , S27, S37	16	0			
OCB7	S26 , S13, S18, S30	6	0			
OCB8	S28	4	0			
Shrub/Early Successional Bird Breeding Habitat Shrub/Early Successional Indicator Species, Breeding Bird Period, Late Mav – Early July						
SSB4	S07 , S18, S13	1	0			
SSB5	S22	4	0			

Table 7. Bird Mortalities Documented at Turbines within 120m of Significant Bird Habitat

1: Turbines in bold font are those searched twice-weekly from May to October for bird mortalities.

2: Target species are indicator species that are found during the appropriate seasons, as defined by the DRAFT Significant Wildlife Habitat Ecoregion 6E Criterion Schedule (OMNR 2012), which have been used to determine significance of habitats during pre-construction surveys. No target species (i.e. indicator species during the appropriate significant seasonality for the Significant Wildlife Habitat) mortalities were documented at any turbines within 120m of significant Marsh Bird Breeding Habitat, Open Country Bird Breeding Habitat, or Shrub/Early Successional Bird Breeding Habitat. However, some mortalities of target species were documented during the habitat-appropriate season at turbines located within 120m of significant bird habitats, including:

- ML1: Four (4) migratory songbird mortalities during the migratory period across the two (2) turbines located within 120m of the habitat (Blackburnian Warbler, *Dendroica fusca,* August 20; Northern Parula, *Setophaga americana,* September 17; and two (2) Golden-crowned Kinglets, *Regulus satrapa,* October 22);
- ML2: One (1) migratory songbird mortality during the migratory period at the one (1) turbine located within 120m of the habitat (Black-throated Green Warbler, *Setophaga virens,* May 7);
- ML3: Five (5) migratory songbird mortalities during the migratory period at the one (1) turbine located within 120m of the habitat (Bobolink, *Dolichonyx oryzivorus*, August 10; *Vireo* sp., August 24; Philadelphia Vireo, *Vireo philadelphicus*, September 10; and two (2) Golden-crowned Kinglets, *Regulus satrapa*, October 22);
- ML4: Eight (8) migratory songbird mortalities during the migratory period across the five (5) turbines located within 120m of the habitat (Golden-crowned Kinglet, *Regulus satrapa,* April 2; Golden-crowned Kinglet, *Regulus satrapa,* April 30; Passerine sp., May 21; Purple Martin, *Progne subis,* August 6; Tree Swallow, *Tachycineta bicolor,* August 6; Eastern Kingbird, *Tyrannus tyrannus,* September 7; Red-eyed Vireo, *Vireo olivaceus,* September 21; and Golden-crowned Kinglet, *Regulus satrapa,* October 19);
- ABB1: One (1) potential area-sensitive bird species mortality across the two (2) turbines located within 120m of the habitat (Passerine sp., not able to be confirmed to species level, June 29).

Overall, no more than five (5) target bird mortalities were observed at any single turbine within 120m of a Significant Wildlife Habitat.

7.0 Raptor Mortality Results

7.1 Raptor Mortalities

Mortality searches for raptors were conducted once weekly in January, February, March, and December at all 26 turbines. In addition, searches were conducted twice weekly in conjunction with avian and bat mortality searches from May through October and once weekly in April and November at the subset of 10 turbines. These surveys resulted in the observation of three (3) raptor mortalities at the Amherst Island WP, including two (2) mortalities of Turkey Vulture (*Cathartes aura*) and one (1) mortality of Red-tailed Hawk (*Buteo jamaicensis*).

Raptor mortalities were documented in June, August, and November (n = 1 each), respectively, and were each observed at a different turbine, including one (1) at each of S03, S22, and S26.

No mortalities of provincially-tracked raptor species were documented during raptor mortality monitoring in 2020 (MNRF 2019).

A list of raptor mortalities observed during the carcass searches has been provided in Appendix IV, and turbine maps identifying the location of each observed mortality have been provided in Appendix VI.

7.2 Corrected (Estimated) Raptor Mortality

Using an assumed searcher efficiency value of 1.00 along with the compiled seasonal scavenger removal trial results for raptors, the proportion of area searched for June, August and November respectively (the months when raptor mortalities occurred), and direct mortality observations, the estimated raptor mortality rate is as follows:

CJune	= 1 / (1.00*0.90*0.99) = 1 / 0.8910 = 1.12 raptors = 1.12 raptors / 10 turbines = 0.11 raptors/turbine = 0.11 raptors / 28.58MW = 0.04 raptors/MW
C _{August}	= 1 / (1.00*0.90*1.00) = 1 / 0.9000 = 1.11 raptors = 1.11 raptors / 10 turbines = 0.11 raptors/turbine = 0.11 raptors / 28.58MW = 0.04 raptors/MW

C_{November} = 1 / (1.00*1.00*1.00) = 1 / 1.0000 = **1.00 raptors** = 1.00 raptors / 10 turbines = **0.10 raptors/turbine** = 0.10 raptors / 28.58MW = 0.03 raptors/MW

Based on the information collected during the 2020 post-construction monitoring period, the anticipated impact of this facility on raptors is characterized by an estimated mortality rate of **0.32 raptors/turbine/year** (0.11 raptors/MW/year).

7.3 Monthly Raptor Surveys

Monthly mortality searches for raptors were conducted from May to November at the turbines which are not included in the subset of 10 turbines regularly monitored during that period. These monthly searches resulted in two (2) additional raptor mortalities documented at the Amherst Island WP, including one (1) mortality of Turkey Vulture and one (1) mortality of Osprey.

Both raptor mortalities were documented in May, and were observed at S11 and S37, respectively.

7.4 Mortalities Documented Near Significant Raptor Habitats

Based on the proximity of the project to significant raptor wintering area habitat, additional consideration is required for turbines within 120m of any significant bird habitat to evaluate potential effects to nearby habitats. Table 8 outlines the number of raptor mortalities documented at each turbine found within 120m of significant raptor habitat at the Amherst Island WP in 2020.

Habitat Name	Turbines Within 120m ¹	Total Documented Raptor Mortalities	Target Raptor Mortalities ²
Raptor Wintering Area Habitat Overwintering Raptors, January -March, November-December			
RWA2	S03 , S05 , S09, S11, S16, S20, S34	2	1
RWA3	S01 , S22 , S04, S29, S31	1	0
RWA4	S31	0	0
RWA5	S36 , S19, S21, S37	1	0
RWA6	S02 , S07 , S14 , S26 , S13, S18, S27, S30, S37	2	0
RWA7	S26 , S28 , S33	1	0

Table 8. Raptor Mortalities Documented at Turbines within 120m of Significant RaptorHabitat

1: Turbines in bold font are those searched once-weekly in April, twice-weekly from May to October, and once-weekly in November for raptor mortalities.

2: Target species are indicator species that are found during the appropriate seasons, as defined by the DRAFT Significant Wildlife Habitat Ecoregion 6E Criterion Schedule (OMNR 2012), which have been used to determine significance of habitats during pre-construction surveys.

Only one (1) target raptor mortality (i.e. an indicator species during the appropriate season) was documented at the Amherst Island WP in 2020. This observation was a Red-tailed Hawk found on November 3, 2020, which is during the seasonality associated with the significant raptor wintering area (RWA2).

Overall, no more than one (1) raptor mortality was observed at any single turbine within 120m of a Significant Wildlife Habitat for raptors.

8.0 Bat Mortality Results

8.1 Bat Mortalities

During the 2020 mortality monitoring period at the Amherst Island WP, NRSI biologists documented 45 bat mortalities within the 50m radius of the subset of 10 turbines searched. In addition, one (1) live Silver-haired Bat (*Lasionycteris noctivagans*) was encountered while completing mortality monitoring at the subset of 10 turbines. The live bat did not show any visible signs of injury and appeared to behave normally. As a result, it was moved outside of the 50m search radius and placed on a nearby tree, where it was observed to climb up the trunk. Upon visiting it later the same day, the bat was no longer present. As this bat is assumed to have recovered, it has not been included in the calculation of estimated mortality rates below.

Bat mortalities observed by NRSI biologists represented five (5) different species, including the resident species Big Brown Bat (*Eptesicus fuscus*) and Little Brown Myotis (*Myotis lucifugus*), as well as all three (3) long-distance migratory species; Hoary Bat, Eastern Red Bat, and Silver-haired Bat. The most abundant species observed was Hoary Bat (n=16), followed by Silver-haired Bat (n=12), Big Brown Bat (n=11), Eastern Red Bat (n=5), and Little Brown Myotis (n=1). Observed mortalities of the three (3) migratory bat species combine to represent 73% of all documented mortalities.

A detailed examination of bat mortalities at the Amherst Island WP is included in the following sections. Detailed information regarding each bat mortality observed during carcass searches has been provided in Appendix V.

8.2 Temporal Distribution of Bat Mortalities

Bat mortalities were observed throughout the monitoring period between late May and mid- to late September, but were most commonly observed during August (n=22) which accounted for 49% of all bat mortalities. The greatest number of bat mortalities documented on a single search date was five (5), observed on August 13, 2020 (see Figure 3).



Figure 3. Bat Mortalities Observed by Date at the Amherst Island WP (2020)

Patterns of migratory bat mortalities appear to be generally consistent with the expected migratory time periods for these species, with increases in migratory bat mortalities during the mid- to late-summer. Overall, bat mortality was most commonly observed during the month of August, corresponding to the fall dispersal and migration period for bats.

8.3 Spatial Distribution of Bat Mortalities

Bat mortalities were observed at all 10 of the subset turbines at the Amherst Island WP in 2020. The number of mortalities observed at each of the 10 turbines was relatively consistent, but ranged from three (3) mortalities each at S07 and S28 to seven (7) mortalities at S05 (Figure 4).



Figure 4. Bat Mortalities Observed by Turbine at the Amherst Island WP (2020)

Distance and direction of bat mortalities from each of the turbine bases were also documented for each observed mortality. Bat mortalities were found throughout the area searched by NRSI biologists, ranging in distance from 0m to 50m from the turbine base, and averaging a distance of approximately 28m from the turbine base. The overall distribution of mortalities by distance class can be seen in Figure 5. Maps identifying the locations of each observed mortality by turbine are included in Appendix VI.



Figure 5. Bat Mortalities Observed by Distance from Turbine at the Amherst Island WP (2020)

8.4 Corrected (Estimated) Bat Mortality

Based on the field observations at the Amherst Island WP, NRSI biologists have compiled the appropriate searcher efficiency trials, scavenger removal trials, proportion of area searched, and direct mortality values in an equation that will be used to estimate the total bat mortality at the Amherst Island WP in 2020. The equation recommended by the MNRF is found below:

C = c / (Se*Sc*Ps)

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

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

 C_{May} = 2 / (0.88*0.64*0.91) = 2 / 0.5125 = **3.90 bats** = **0.39 bats/turbine** (0.14 bats/MW)

CJune	= 7 / (0.88*0.64*0.99) = 7 / 0.5576 = 12.55 bats = 1.26 bats/turbine (0.44 bats/MW)
C _{July}	= 7 / (0.91*0.44*1.00) = 7 / 0.4004 = 17.48 bats = 1.75 bats/turbine (0.61 bats/MW)
CAugust	= 22 / (0.91*0.44*1.00) = 22 / 0.4004 = 54.95 bats = 5.50 bats/turbine (1.92 bats/MW)
$C_{September}$	= 7 / (0.90*0.62*1.00) = 7 / 0.5580 = 12.54 bats = 1.25 bats/turbine (0.44 bats/MW)
C _{October}	= 0 / (0.90*0.62*1.00) = 0 / 0.5580 = 0.00 bats = 0.00 bats/turbine (0.00 bats/MW)

Using the appropriate variables and recommended equations provided by the MNRF, NRSI has determined the corrected (estimated) bat mortality of the Amherst Island WP in 2020. Each of the corrected monthly rates and the corrected annual mortality rate for the Amherst Island WP can be seen in Table 9.

Table 9. Corrected Bat Mortality Ra	ates Based on Mortality	/ Monitoring at the A	Amherst Island
WP (2020)			

Month (2020)	Observed Bat Mortalities	Corrected Mortality (bats/turbine)	Corrected Mortality (bats/MW)
Мау	2	0.39	0.14
June	7	1.26	0.44
July	7	1.75	0.61
August	22	5.50	1.92
September	7	1.25	0.44
October	0	0	0
TOTAL	45	10.15	3.59

Based on the information collected during the 2020 post-construction monitoring period, the anticipated impact of this facility on bats is characterized by a corrected mortality rate of **10.15 bats/turbine/year** (3.59 bats/MW/year).

9.0 Comparative Annual Results

Mortality monitoring conducted by NRSI in 2020 represents the second year of postconstruction monitoring conducted at the Amherst Island Wind Project. The following section provides a comparison of the 2019 and 2020 post-construction mortality monitoring results.

9.1 Avian Mortality Results

Table 10 below provides an abbreviated summary of total bird mortalities, monitoring periods, and corrected (estimated) mortality rates for each of the two (2) years of mortality monitoring conducted to-date at the Amherst Island WP.

Table 10.	Comparative Result	s of Avian Morta	ality Monitoring	Seasons (2019-2	2020)
			J		/

Year	Total Mortalities	Monitoring Poriod	Corrected Mortality Rates		
		wonitoring Period	Birds/Turbine/Year	Birds/MW/Year	
2019	28	May 1 – October 31	4.77	1.66	
2020	39	May 1 – October 31	8.14	2.85	

Further details of the 2020 avian mortality results can be found in Section 6.0 of this report.

9.2 Raptor Mortality Results

Table 11 below provides an abbreviated summary of total raptor mortalities, monitoring periods, and corrected (estimated) mortality rates for each of the two (2) years of mortality monitoring conducted to-date at the Amherst Island WP.

Table 11.	Comparative	Results o	of Raptor	Mortality	Monitoring	Seasons	(2019-2020)
-----------	-------------	-----------	-----------	-----------	------------	---------	-------------

Voor	Total	Monitoring Poriod	Corrected Mortality Rates		
rear	Mortalities	Monitoring Period	Raptors/Turbine/Year	Raptors/MW/Year	
2019	3	January 1 – December 31	0.19	0.07	
2020	3	January 1 – December 31	0.32	0.11	

Further details of the 2020 raptor mortality results can be found in Section 7.0 of this report.

9.3 Bat Mortality Results

Table 12 below provides an abbreviated summary of total bat mortalities, monitoring periods, and corrected (estimated) mortality rates for each of the two (2) years of mortality monitoring conducted to-date at the Amherst Island WP.
Voor	Total	Monitoring Poriod	Estimated Mortality Rates							
rear	Mortalities	wonitoning Period	Bats/Turbine/Year	Bats/MW/Year						
2019	35	May 1 – October 31	5.36	1.88						
2020	45	May 1 – October 31	10.15	3.59						

Table 12. Comparative Results of Bat Mortality Monitoring Seasons (2019-2020)

Further details of the 2020 bat mortality results can be found in Section 8.0 of this report.

9.4 Summary

Although a general comparison between the two (2) years of post-construction monitoring data is possible, the differences in searcher efficiency rates, scavenger removal rates, and proportion area searched over these two (2) monitoring years do not necessarily allow for a direct comparative analysis of observed mortalities. Local bird and bat abundance and behaviour will also change annually based on other variables, such as weather conditions, adjacent land uses, food availability, or general variations in population numbers, further adding to the challenges of making direct comparisons between monitoring years.

Despite these comparative challenges, general comparisons between the monitoring years have been made. Overall, an increase in the number of bird and bat mortalities was observed in 2020, relative to the 2019 monitoring results. The number of raptor mortalities documented was the same in 2020 relative to 2019, but overall, differences in the time of year the raptor mortalities were documented in each year results in a higher estimate of raptor mortality in 2020.

10.0 Mortality Thresholds and Notifications

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

10.1 Annual Bird Mortality

The annual bird mortality threshold for the Amherst Island WP is 14 birds/turbine/year, calculated by individual turbine or turbine group. Based on an estimated rate of 8.14 birds/turbine/year, as calculated by turbine group, the Amherst Island WP remains below this threshold. Since the results are below the established threshold, no notification is required.

10.2 Annual Raptor Mortality

The annual raptor mortality threshold for the Amherst Island WP is 0.2 raptors/turbine/year (or 0.1 raptors/turbine/year for provincially tracked raptors). Based on an estimated rate of 0.32 raptors/turbine/year, the Amherst Island WP has exceeded this threshold. The submission of this report to the MNRF and MECP will satisfy the requirement to notify the MNRF within three (3) months of the end of the calendar year in which monitoring activities occurred that the threshold has been exceeded.

As no mortalities of provincially tracked raptors were observed, the Amherst Island WP remains below the threshold of 0.1 raptors/turbine/year for provincially tracked raptors.

10.3 Annual Bat Mortality

The annual bat mortality threshold for the Amherst Island WP is 10 bats/turbine/year. Based on an estimated rate of **10.15 bats/turbine/year**, this threshold has been exceeded. The submission of this report to the MNRF will satisfy the requirement to notify the MNRF within three (3) months of the end of the calendar year in which monitoring activities occurred that the threshold has been exceeded.

10.4 Significant Bird Mortality Event

Significant bird mortality events have been defined by the MNRF as single-day mortality events with 10 or more birds at any one turbine or 33 or more birds (including raptors) at multiple turbines. Neither of these single-day mortality events was noted at the Amherst Island WP during the 2020 monitoring year. As no significant bird mortality event occurred, no notification is required.

10.5 Bird Mortality Documented Near Significant Bird Habitats

As identified in the EEMP for the Amherst Island WP (Stantec 2013), bird mortality at turbines located within 120m of significant bird habitats should also be considered separately from project-wide mortality rates. No target bird mortalities (i.e. indicator species during the appropriate seasons within 120m of identified habitats) were documented at turbines within 120m of significant Marsh Bird Breeding Habitat, Open Country Bird Breeding Habitat, or Shrub/Early Successional Bird Breeding Habitat.

At the significant Landbird Migratory Stopover Area habitats, target bird mortality was not documented to be greater than eight (8) target birds at turbines within 120m of any individual significant habitat in 2020, ranging from zero (0) target birds at the one (1) turbine within 120m of ML5 to a combined eight (8) target bird mortalities at the five (5) turbines within 120m of ML4.

In addition, mortality of target overwintering raptors was limited to a single target mortality, a Red-tailed Hawk documented on November 3rd within 120m of significant raptor overwintering area RWA2.

Based on the observed results within 120m of the applicable Significant Wildlife Habitats, there has not been significant mortality of target birds at turbines within 120m of the applicable habitats. As such, no notification is required.

10.6 Species at Risk Mortality Event

Any Species at Risk (SAR; MECP 2020) mortality documented during post-construction mortality monitoring at the Amherst Island WP requires formal notification to the MNRF and MECP within 24 hours (or next business day) of a confirmed species identification.

In accordance with this requirement, a notification was sent to the MNRF and MECP within 24 hours (or next business day), following a confirmed identification of any SAR mortality at the Amherst Island WP.

11.0 Summary and Conclusions

NRSI was retained to conduct the second year of post-construction monitoring at the operational Amherst Island WP. The Amherst Island WP consists of 26 wind energy generating turbines, with a total nameplate capacity of 74.3MW.

Post-construction monitoring at the Amherst Island WP in 2020 included bird, bat and raptor mortality monitoring, and the corresponding searcher efficiency trials, scavenger removal trials, and visibility class mapping required to calculate estimated mortality rates. These surveys were conducted to assess the potential impacts of this wind energy generating facility on local and migratory birds and bats.

A total of 39 avian mortalities were documented at the Amherst Island WP during the 2020 monitoring period. Based on the observed avian mortalities in 2020, the potential impact of this facility was largely associated with common migratory songbirds. Given the number of observed avian mortalities, searcher efficiency rates, scavenger removal rates, proportion of area searched, and the equation recommended by the MNRF, a corrected (estimated) avian mortality rate of **8.14 birds/turbine/year** (2.85 birds/MW/year), as calculated by turbine group, has been determined for the Amherst Island WP. This estimated mortality rate is below the provincial threshold level of 14 birds/turbine/year established by the MNRF guidelines. No significant bird mortality events of 10 or more birds at any one turbine or 33 or more birds (including raptors) at multiple turbines on a single survey date were observed during the monitoring program in 2020.

Three (3) raptor mortalities were documented during the 2020 monitoring period for raptor mortality estimation at the Amherst Island WP. Based on the observed raptor mortalities, a corrected (estimated) raptor mortality rate of **0.32 raptors/turbine/year** (0.11 raptors/MW/year) has been determined for the Amherst Island WP. This raptor mortality rate is above the provincial threshold level of 0.2 raptors/turbine/year established by the MNRF guidelines. No mortalities of provincially tracked raptors were observed during applicable seasons in which observations are tracked.

A total of 45 bat mortalities were documented during the 2020 mortality monitoring period at the Amherst Island WP. Migratory bat species were the most commonly observed mortalities at the project. Based on the observed bat mortalities, searcher efficiency rates, scavenger removal rates, proportion of area searched, and equations recommended by the MNRF, a corrected (estimated) bat mortality rate of **10.15 bats/turbine/year** (3.59 bats/MW/year) has been determined for the Amherst Island WP. This estimated bat mortality rate is above the provincial threshold level of 10 bats/turbine/year established by the MNRF guidelines.

12.0 References

- Ministry of Environment, Conservation and Parks (MECP). 2020. Species at Risk in Ontario. Available at: https://www.ontario.ca/page/species-risk-ontario.
- Ministry of Natural Resources and Forestry (MNRF). 2019. Species Lists: Birds. Natural Heritage Information Centre (NHIC). Queen's Printer for Ontario. Available at: http://www.mnr.gov.on.ca/en/Business/NHIC/2ColumnSubPage/STDU_138223.ht ml.
- Ontario Ministry of Natural Resources (OMNR). 2012. Significant Wildlife Habitat Ecoregion 6E Criterion Schedule. DRAFT February 2012. 42 pp.
- Ontario Ministry of Natural Resources (OMNR). 2011a. Bats and Bat Habitats: Guidelines for Wind Power Projects. First Edition. July 2011.
- Ontario Ministry of Natural Resources (OMNR). 2011b. Bird and Bird Habitats: Guidelines for Wind Power Projects. First Edition. December 2011.
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Maps







Appendix I Post-construction Monitoring Data Sheets

Bird and Bat Mortality Search Summary

Date (dd/mm/yy)://	Observer(s):		Project Name:	Project No:	
Start Time (24hrs):hrs	5	Dog Used? Y N	Days	s Since Last Search (<i>i.e. Mon to Thurs</i> = 3 days):	_days
WEATHER Temp:°C Visibility: Hiah Medium Low	Cloud Cover: % Precip: None Rain	Wind Speed: Foa	Weather Comments:	Wind Direction (from): (use N,SW, etc.)	
		Sig	nificant Weather before visit?) 	
COMMENTS (ex. wildlife notes, la	andowner interactions, turbine n	aintenance, unsearchable are	eas, etc.)		

SEARC	H RESU	JLTS														
Sched	luled Se	earch	Mortality Results.	Enter "None" if no morta	alities	found.										
Turbine #	Start Time (24hr)	End Time (24hr)	Sample ID (PROJ#- DDMMYY-TXX- Mortality No.)	Species Found	Bat FA (mm)	Sex (M/F)	U	ГМ Nacifician	Dist. from Turbine	Dir. from Turbine (°)	сс	Est. Time Since Death	Injuries	Substrate/Habitat	VC	Photo No.(s)
	(=)	()			()		Easting	Northing	(m)	()		(hrs)				

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)

Page ____ of ____

Scavenger Removal Data Form

Project Name:_____

Project #: _____

0 0 1	Visit #	Visit Day Date O		Obs.	Temp (°C)	Wind Speed	Wind Direction	Precip.	Visibility	Cloud Cover (%)	Cloud Height
1 Image: Speciment 1:	0	0									
2 3 4 1 <th1< th=""> <th1< th=""> <th1< th=""> <th1< th=""></th1<></th1<></th1<></th1<>	1										
3 4 1	2										
4 Specimen 1: Species Dist: Dir: UTM: Turbine No Specimen 1: Specimen 2: Specimen 1: Dist: Dir: UTM: Specimen 2: Specimen 1 Specimen 2 Specimen 2 Specimen 2 N Image: Specime 1 Specimen 1 Specimen 2 Specimen 2 N Image: Specime 1 Scavenging No.(s) Present Signs of Scavenging No.(s) Photo Scavenging No.(s) Turbine No Specimen 1: Specime 1: Specime 1: Specime 1: Specimen 1: Specime 2 Dist: Dir: UTM:	3										
Turbine No. Specimen 1: Specise Dist: Dir: UTM: Specimen 2: Specimen 1 Specimen 2 Notes: Dist: Dist: Dir: UTM: N Day Time Present Signs of Signs of Scavenging No.(s) Present Signs of No.(s) Turbine No. Specimen 1: Species Dist: Dir: UTM: Turbine No. Specimen 1: Species Dist: Dir: UTM: Specimen 1: Species Dist: Dir: UTM: Specimen 2: Specimen 1: Species Dist: Dir: UTM: Specimen 2: Specimen 1: Species Dist: Dir: UTM: Specimen 2: Specimen 2: Specimen 1: Specimen 2: Dist: Dir: UTM: Visibility Class: Notes: Dir: UTM:	4										
Turbine No. Specimen 1: SpeciesNotes: UTM: Specimen 2: Specimen 1: Notes: Notes: Notes: N Day Time Specimen 1: Notes: UTM:											
Specimen 2: Specimen 1 Specimen 2 Visibility Class: Notes: Day Time Specimen 1 Specimen 2 No.(s) Present Signs of Photo Visibility Class: No.(s) Present Signs of Photo Image: Specimen 1: Specimen 1: Specime 2: Dist: Dir: UTM: Turbine No. Specimen 1: Species Dist: Dir: UTM: UTM: Specimen 2: Specimen 1: Species Dist: Dir: UTM: UTM: Specimen 2: Specimen 2: Specime 2: Notes: Dir: UTM: UTM: Notes: Dir: UTM: UTM: Specimen 2 Notes: Notes: Dir: UTM: Specimen 2 Specimen 1 Specimen 2 Notes: Day Time Scavenging No.(s) Present Signs of Photo Notes: Dir: UTM: Dir: Dir: Dir: Signs of No.(s) Notes: Dir Dir Dir Signs of </td <td>Turbine I</td> <td>No</td> <td></td> <td>Spe</td> <td>cimen 1:</td> <td>Species Visibility C</td> <td> Dis lass: N</td> <td>t: Dir: otes:</td> <td> UTM:</td> <td></td> <td></td>	Turbine I	No		Spe	cimen 1:	Species Visibility C	Dis lass: N	t: Dir: otes:	UTM:		
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N Day Time Specimen 1 Specimen 2 Present Signs of Scavenging Photo No.(s) Present Signs of Scavenging Photo No.(s) Image: Species in the system Image: Species intervent in				She	cimen z.	Visibility C	lass: N	otes:	01101.		
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Turbine No. Specimen 1: Species Dist: Dir: UTM: Visibility Class: Notes:											
Specimen 2: Species Dist: Dir: UTM: Visibility Class: Notes: N Specimen 1 Specimen 2 Day Time Signs of Photo Scavenging Photo No.(s) Present Signs of Scavenging No.(s) Image: Comparison of the second seco	Turbine I	No		Spe	cimen 1:	Species Visibility Cl	Dis ass: No	t: Dir: btes:	UTM:		
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			N.				Scavengir	ng No.(s)	Scavenging	No.(s)
		A •									
		*									
			a de la constance de								

Searcher Efficiency	Data Forr	m			Project #:			
Date:	Time:	hrs				Searc	cher:	Placed By:
Condition of Carcasses:	Fresh	Thawed		Carcasses marked (and	d how)?			
WEATHER Temp: °C	*Wind	d Speed:		Wind Direction (from): _		Visibility:	High Medium	Low
Cloud Cover (%):	Cloud	d Height: H	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	×	×
T#									

Visibility Class Map



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

Appendix II Scavenger Removal Trial Results

Appendix II 2121C Amherst Island WP 2020 Scavenger Removal Trial Results

Small Birds and Bats Trials

Spring (May/June)

NumberHilblifeOptionSpeciesTurbine Base (m)Turbine Base (m)Turbine Base (m)Turbine Base (m)EastingNorthingClassPresentPresentSigns of ScareigingHeater1S05Eastern Red Bat3185362703488888991 $\frac{11.May-20}{400}$ YCarcass placedSearcher1S05Eastern Red Bat3185362703488888991 $\frac{11.May-20}{400}$ YNoneSearcher2S01Red-eyed Vireo2621535916348895252 $\frac{11.May-20}{400}$ YNo further signsSearcher2S01Red-eyed Vireo2621535916348895252 $\frac{11.May-20}{20}$ YNoneSearcher3S02Hoary Bat93536649548903812 $\frac{14.May-20}{20}$ YNoneSearcher3S02Hoary Bat93536649548903812 $\frac{14.May-20}{20}$ YNoneSearcher3S02Hoary Bat93536649548903812 $\frac{14.May-20}{20}$ YNoneSearcher3S02Hoary Bat93536649548903812 $\frac{10.4}{20}$ 11.May-20YNoneSearcher330.14.May-20YNoneSearcher $\frac{10.4}{20}$ YNoneSearcher330.14.May-20YNoneSearcher $\frac{10.4}{20}$	Carcass	Turbino	Spanias	Distance from	Direction from	UTM (Z	one 18T)	Visibility	Test Day	Data	Carcass	Signs of Socyonging	Tester
$ \begin{array}{ c c c c c c c } 1 & & & & & & & & & & & & & & & & & & $	Number	Turbine	opecies	Turbine Base (m)	Turbine Base (°)	Easting	Northing	Class	Test Day	Date	Present	Signs of Scavenging	rester
$ \begin{array}{ c c c c c c } \hline 1 & So5 & Eastern Red Bat \\ 1 & So5 & Eastern Red Bat \\ \hline 1 & So5 & Eastern Red Bat \\ \hline 1 & So5 & Eastern Red Bat \\ \hline 1 & So5 & Eastern Red Bat \\ \hline 1 & Bay 3 & 14-May-20 & Y & None & Searcher \\ \hline 1 & Day 7 & 18-May-20 & Y & None & Searcher \\ \hline 1 & Day 14 & 25-May-20 & Y & None & Searcher \\ \hline 1 & Day 14 & 25-May-20 & Y & None & Searcher \\ \hline 1 & Day 14 & 25-May-20 & Y & None & Searcher \\ \hline 1 & Day 14 & 25-May-20 & Y & None & Searcher \\ \hline 1 & Day 3 & 14-May-20 & Y & None & Searcher \\ \hline 1 & Day 14 & 25-May-20 & Y & None & Searcher \\ \hline 1 & Day 3 & 14-May-20 & Y & None & Searcher \\ \hline 1 & Day 3 & 14-May-20 & Y & None & Searcher \\ \hline 1 & Day 7 & 18-May-20 & Y & None & Searcher \\ \hline 1 & Day 14 & 25-May-20 & N & - & Searcher \\ \hline 1 & Day 14 & 25-May-20 & N & - & Searcher \\ \hline 1 & Day 14 & 25-May-20 & N & - & Searcher \\ \hline 1 & Day 14 & 25-May-20 & N & - & & Searcher \\ \hline 1 & Day 14 & 25-May-20 & N & - & & Searcher \\ \hline 1 & Day 14 & 25-May-20 & Y & None & Searcher \\ \hline 1 & Day 14 & 25-May-20 & Y & None & & Searcher \\ \hline 1 & Day 14 & 25-May-20 & N & - & & & \\ \hline 1 & Day 14 & 25-May-20 & N & - & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & & \\ \hline 1 & Day 14 & 25-May-20 & N & & & & & & \\ \hline 1 & Day 2 & 11-May-20 & Y & & & & & \\ \hline 1 & Day 2 & 11-May-20 & Y & & & & & \\ \hline 1 & Day 2 & 11-May-20 & Y & & & & & \\ \hline 1 & Day 2 & 11-May-20 & Y & & & & & \\ \hline 1 & Day 2 & 11-May-20 & Y & & & & \\ \hline 1 & Day 2 & 11-May-20 & Y & & & & \\ \hline 1 & Day 2 & 11-May-20 & Y &$									Day 0	11-May-20	Y	Carcass placed	Searcher A
1 S05 Eastern Red Bat 31 85 362703 4888889 1 Day 7 18-May-20 Y None Searcher Day 10 21-May-20 Y Carcass moved 2 m onto road Searcher Day 10 21-May-20 Y None Searcher Day 10 21-May-20 Y None Searcher Day 11 25-May-20 Y Nofuther signs Searcher Day 14 25-May-20 Y None Searcher Day 14 25-May-20 Y None Searcher Day 14 25-May-20 Y None Searcher Day 14 25-May-20 N Carcass placed Searcher Day 14 25-May-20 N Carcass placed Searcher Day 14 25-May-20 N - Searcher Day 3 14-May-20 Y None Searcher Day 3 14-May-20 Y None Searcher Day 14	1								Day 3	14-May-20	Y	None	Searcher A
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Image: constraint of the constr	1								Day 10	21-May-20	Y	Carcass moved 2 m onto road	Searcher A
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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	1								Day 0	11-May-20	Y	Carcass placed	Searcher A
2 S01 Red-eyed Vireo 26 215 359163 4889525 2 Day 7 18-May-20 Y None Searcher Day 10 21-May-20 N Carcass removed Searcher Day 14 25-May-20 N Carcass removed Searcher 3 S02 Hoary Bat 9 35 366495 4890381 2 Day 14 25-May-20 Y Carcass placed Searcher 3 S02 Hoary Bat 9 35 366495 4890381 2 Day 0 11-May-20 Y None Searcher Day 14 25-May-20 N Carcass removed Searcher Day 14 25-May-20 Y None Searcher Day 14 25-May-20 N Carcass removed Searcher Day 14 25-May-20 N Carcass placed Searcher Day 14 25-May-20 N - Searcher Day 14 25-May-20 N - Searcher Day 14 25-May-20 N - Searcher Day 14 25-May-20 </td <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Day 3</td> <td>14-May-20</td> <td>Y</td> <td>None</td> <td>Searcher A</td>	1								Day 3	14-May-20	Y	None	Searcher A
Image: Solution of the searcher Image: Solution of the searcher Image: Solution of the searcher Image: Day 10 21-May-20 N Carcass removed Searcher 3 Solution of the searcher	2	S01	Red-eyed Vireo	26	215	359163	4889525	2	Day 7	18-May-20	Y	None	Searcher A
And Markov And Markov <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Day 10</td> <td>21-May-20</td> <td>N</td> <td>Carcass removed</td> <td>Searcher A</td>	1								Day 10	21-May-20	N	Carcass removed	Searcher A
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Day of Frindy 20 1 Hono Oddionor	1								Day 3	14-May-20	Y	None	Searcher A
4 S26 Semipalmated Sandpiper 16 105 367385 4892528 1 Day 7 18-May-20 N Carcass removed; only a few feathers remain	4	S26	Semipalmated Sandpiper	16	105	367385	4892528	1	Day 7	18-May-20	Ν	Carcass removed; only a few feathers remain	Searcher A
Day 10 21-May-20 N - Seacher	1								Day 10	21-May-20	N	-	Seacher A
Day 14 25-May-20 N - Searcher									Day 14	25-May-20	Ν	-	Searcher A
Day 0 11-May-20 Y Carcass placed Searcher									Day 0	11-May-20	Y	Carcass placed	Searcher A
Day 3 14-May-20 Y Only right wing remains Searcher	1								Day 3	14-May-20	Y	Only right wing remains	Searcher A
5 S28 Brown Creeper 46 195 369029 4893080 2 Day 7 18-May-20 Y No further signs Searcher	5	S28	Brown Creeper	46	195	369029	4893080	2	Day 7	18-May-20	Y	No further signs	Searcher A
Day 10 21-May-20 N Carcass removed Searcher	1								Day 10	21-May-20	N	Carcass removed	Searcher A
Day 14 25-May-20 N - Searcher	1								Day 14	25-May-20	N	-	Searcher A
Day 0 01-Jun-20 Y Carcass placed Searcher									Day 0	01-Jun-20	Y	Carcass placed	Searcher A
Day 3 04-Jun-20 N Carcass removed Searcher	1								Day 3	04-Jun-20	N	Carcass removed	Searcher A
6 S07 Hoary Bat 40 225 366785 4891609 2 Day 7 08-Jun-20 N - Searcher	6	S07	Hoary Bat	40	225	366785	4891609	2	Day 7	08-Jun-20	N	-	Searcher A
Day 10 11-Jun-20 N - Searcher	1								Day 10	11-Jun-20	N	-	Searcher A
Day 14 15-Jun-20 N - Searcher									Day 14	15-Jun-20	Ν	-	Searcher A
Day 0 01-Jun-20 Y Carcass placed Searcher									Day 0	01-Jun-20	Y	Carcass placed	Searcher A
Day 3 04-Jun-20 Y None Searcher	1								Day 3	04-Jun-20	Y	None	Searcher A
7 S14 Red-eyed Vireo 48 60 366823 4891192 1 Day 7 08-Jun-20 N Carcass removed Searcher	7	S14	Red-eyed Vireo	48	60	366823	4891192	1	Day 7	08-Jun-20	N	Carcass removed	Searcher A
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Day 14 15-Jun-20 N - Searcher	1								Day 14	15-Jun-20	N	-	Searcher A
Day 0 01-Jun-20 Y Carcass placed Searcher									Day 0	01-Jun-20	Y	Carcass placed	Searcher C
Day 3 04-Jun-20 Y Only wings remain Searcher	1								Day 3	04-Jun-20	Y	Only wings remain	Searcher C
8 S22 Silver-haired Bat 46 160 361472 4890666 1 Day 7 08-Jun-20 Y No further signs Searcher	8	S22	Silver-haired Bat	46	160	361472	4890666	1	Day 7	08-Jun-20	Y	No further signs	Searcher C
Day 10 11-Jun-20 N Carcass removed Searcher	1								Day 10	11-Jun-20	N	Carcass removed	Searcher C
Day 14 15-Jun-20 N - Searcher									Day 14	15-Jun-20	N	-	Searcher C
Day 0 01-Jun-20 Y Carcass placed Searcher									Day 0	01-Jun-20	Y	Carcass placed	Searcher C
Day 3 04-Jun-20 N Carcass removed Searcher	1								Day 3	04-Jun-20	N	Carcass removed	Searcher C
9 S03 American Redstart 7 20 360977 4887925 1 Day 7 08-Jun-20 N - Searcher	9	S03	American Redstart	7	20	360977	4887925	1	Day 7	08-Jun-20	N	-	Searcher C
Day 10 11-Jun-20 N - Searcher	1								Day 10	11-Jun-20	N	-	Searcher C
Day 14 15-Jun-20 N - Searcher									Day 14	15-Jun-20	Ν	-	Searcher C
Day 0 01-Jun-20 Y Carcass placed Searcher	1								Day 0	01-Jun-20	Y	Carcass placed	Searcher C
Day 3 04-Jun-20 N Carcass removed Searcher				1					Day 3	04-Jun-20	N	Carcass removed	Searcher C
10 S36 Tree Swallow 20 100 364460 4888399 2 Day 7 08-Jun-20 N - Searcher	10	S36	Tree Swallow	20	100	364460	4888399	2	Day 7	08-Jun-20	Ν	-	Searcher C
Day 10 11-Jun-20 N - Searcher	1								Day 10	11-Jun-20	N	-	Searcher C
Day 14 15-Jun-20 N - Searcher									Day 14	15-Jun-20	Ν	-	Searcher C

Carcass	Turking	Creation	Distance from	Direction from	UTM (Z	one 18T)	Visibility	Test Day	Dete	Carcass	Cierco of Conversion	Tester
Number	Turbine	Species	Turbine Base (m)	Turbine Base (°)	Easting	Northing	Class	Test Day	Date	Present	Signs of Scavenging	Tester
								Day 0	02-Jul-20	Y	Carcass placed	Searcher C
								Day 4	06-Jul-20	Y	None	Searcher C
1	S36	Red-eyed Vireo	21	240	364571	4888392	2	Day 7	09-Jul-20	N	Carcass removed	Searcher C
								Day 11	13-Jul-20	N	-	Searcher A
								Day 14	16-Jul-20	N	-	Searcher A
								Day 0	02-Jul-20	Y	Carcass placed	Searcher C
								Day 4	06-Jul-20	Y	None	Searcher C
2	S05	Tree Swallow	45	10	362655	4888927	2	Day 7	09-Jul-20	Y	None	Searcher C
								Day 11	13-Jul-20	N	Carcass removed	Searcher A
								Day 14	16-Jul-20	Ν	-	Searcher A
								Day 0	02-Jul-20	Y	Carcass placed	Searcher A
								Day 4	06-Jul-20	Y	Part of one wing remains	Searcher A
3	S26	Silver-haired Bat	11	315	367361	4892540	1	Dav 7	09-Jul-20	N	Carcass removed	Searcher A
								Day 11	13-Jul-20	N	_	Searcher A
								Day 14	16-Jul-20	N	_	Searcher A
								Day 0	02-Jul-20	Y	Carcass placed	Searcher A
								Day 4	06-Jul-20	Y	None	Searcher A
4	S07	Eastern Red Bat	25	135	366833	4891626	2	Day 7	00-00-20	N		Searcher A
-	007	Eastern Ned Dat	25	155	300033	4031020	2	Day 1	12 Jul 20	N	Calcass Tellioved	Searcher A
								Day 11	13-Jul-20	IN NI	-	Searcher A
								Day 14	16-Jul-20	N	-	Searcher C
								Day 0	02-Jul-20	T	Carcass placed	Seacher C
-	004	O al da a service a d Kin al at		00	050470	4000500		Day 4	06-Jul-20	N	Carcass removed	Searcher C
5	501	Golden-crowned Kinglet	11	20	359173	4889563	1	Day 7	09-Jul-20	N	-	Searcher C
								Day 11	13-Jul-20	N	-	Searcher A
	-							Day 14	16-Jul-20	N	-	Searcher A
								Day 0	16-Jul-20	Y	Carcass placed	Searcher A
								Day 4	20-Jul-20	Y	None	Searcher D
6	\$05	Hoary Bat	47	75	362711	4888908	1	Day 7	23-Jul-20	N	Carcass removed	Searcher D
								Day 11	27-Jul-20	N	-	Searcher A
								Day 14	30-Jul-20	N	-	Searcher A
								Day 0	16-Jul-20	Y	Carcass placed	Searcher A
								Day 4	20-Jul-20	N	Carcass removed	Searcher D
7	S22	Eastern Kingbird	38	210	361433	4890618	2	Day 7	23-Jul-20	N	-	Searcher D
								Day 11	27-Jul-20	N	-	Searcher A
								Day 14	30-Jul-20	N	-	Searcher A
								Day 0	16-Jul-20	Y	Carcass placed	Searcher A
								Day 4	20-Jul-20	N	Carcass removed	Searcher D
8	S01	Eastern Red Bat	34	200	359165	4889515	2	Day 7	23-Jul-20	N	-	Searcher D
								Day 11	27-Jul-20	N	-	Searcher A
								Day 14	30-Jul-20	Ν	-	Searcher A
								Day 0	16-Jul-20	Y	Carcass placed	Searcher A
	1	1		1				Day 4	20-Jul-20	Y	None	Searcher D
9	S07	Golden-crowned Kinglet	7	30	366819	4891645	2	Dav 7	23-Jul-20	N	Carcass removed	Searcher D
		C C						Day 11	27-Jul-20	Ν	-	Searcher A
								Day 14	30-Jul-20	N	_	Searcher A
								Day 0	16-Jul-20	Y	Carcass placed	Searcher A
	1	1		1				Day 4	20-Jul-20	N	Carcass removed	Searcher D
10	S14	Tree Swallow	28	95	366822	4891163	1	Day 7	23-Jul-20	N	-	Searcher D
10					COULT		· ·	Day 11	27-10-20	N	_	Searcher A
								Day 14	30- Jul-20	N	-	Searchor A
	I	I			1			Day 14	03-Aug-20	V	- Coroosa placed	Searcher A
								Day 0	05-Aug-20	T	Carcass placed	Searcher A
11	600	March W/ron	6	95	361454	1800659	1	Day 3	10 Aug-20	ÍN NI	Carcass removed	Searcher A
11	322		o	CO	301434	4090000		Day /	10-Aug-20	N	-	Searcher A
	1	1		1				Day 10	13-Aug-20	N	-	Searcher A
						1	1	Day 14	17-Aug-20	N	-	Searcher A

Summer (July/August)

Carcass			Distance from	Direction from	UTM (Z	one 18T)	Visibility		_	Carcass		_
Number	Turbine	Species	Turbine Base (m)	Turbine Base (°)	Easting	Northing	Class	Test Day	Date	Present	Signs of Scavenging	Tester
								Day 0	03-Aug-20	Y	Carcass placed	Searcher A
								Day 3	06-Aug-20	Y	None	Searcher A
12	S36	Tree Swallow	24	200	364579	4888380	2	Day 7	10-Aug-20	N	Carcass removed	Searcher A
								Day 10	13-Aug-20	N	-	Searcher A
								Day 14	17-Aug-20	N	-	Searcher A
								Day 0	03-Aug-20	Y	Carcass placed	Searcher A
								Day 3	06-Aug-20	N	Carcass removed	Searcher A
13	S02	Hoary Bat	13	150	366496	4890364	1	Day 7	10-Aug-20	N	-	Searcher A
								Day 10	13-Aug-20	N	-	Searcher A
								Day 14	17-Aug-20	Ν	-	Searcher A
								Day 0	03-Aug-20	Y	Carcass placed	Searcher A
								Day 3	06-Aug-20	N	Carcass removed	Searcher A
14	S28	Golden-crowned Kinglet	31	185	369092	4893094	2	Day 7	10-Aug-20	N	-	Searcher A
		-						Day 10	13-Aug-20	N	-	Searcher A
								Day 14	17-Aug-20	Ν	-	Searcher A
								Day 0	13-Aug-20	Y	Carcass placed	Searcher A
								Day 4	17-Aug-20	N	Carcass removed	Searcher A
15	S28	Silver-haired Bat	34	105	369123	4893114	2	Day 7	20-Aug-20	N	-	Searcher A
								Day 11	24-Aug-20	N	-	Searcher A
								Day 14	27-Aug-20	N	-	Searcher A
								Day 0	24-Aug-20	Y	Carcass placed	Searcher A
								Day 3	27-Aug-20	N	Carcass removed	Searcher A
16	S26	Hoary Bat	8	295	367363	4892537	1	Day 7	31-Aug-20	Ν	-	Searcher A
								Day 10	03-Sep-20	N	-	Searcher A
								Day 14	07-Sep-20	Ν	-	Searcher A
								Day 0	24-Aug-20	Y	Carcass placed	Searcher A
								Day 3	27-Aug-20	Y	None	Searcher A
17	S07	Hoary Bat	11	90	366820	4891641	2	Dav 7	31-Aug-20	Y	None	Searcher A
		-						Day 10	03-Sep-20	Y	None	Searcher A
								Day 14	07-Sep-20	Y	None	Searcher A
								Day 0	24-Aug-20	Y	Carcass placed	Searcher A
								Day 3	27-Aug-20	Y	Mostly scavenged; some bones remain	Searcher A
18	\$36	Swamp Sparrow	21	50	364603	4888412	2	Dav 7	31-Aug-20	Y	No further signs	Searcher A
								Day 10	03-Sep-20	N	Carcass removed	Searcher A
								Day 14	07-Sep-20	N	-	Searcher A
								Day 0	24-Aug-20	Y	Carcass placed	Searcher A
								Dav 3	27-Aug-20	N	Carcass removed	Searcher A
19	S03	Blackburnian Warbler	11	65	361263	4887439	1	Dav 7	31-Aug-20	N	-	Searcher A
								Day 10	03-Sep-20	N	-	Searcher A
								Day 14	07-Sep-20	N	-	Searcher A
		·				İ	Ì	Dav 0	24-Aug-20	Y	Carcass placed	Searcher A
								Day 3	27-Aug-20	Y	Upper half scavenged	Searcher A
20	S05	Silver-haired Bat	11	300	362658	4888885	1	Day 7	31-Aug-20	N	Carcass removed	Searcher A
								Day 10	03-Sep-20	N	-	Searcher A
						1		Day 14	07-Sep-20	N	-	Searcher A

Summer (July/August) Continued

Fall (September/October)

Carcass Turking Species		Species	Distance from	Direction from UTM (Zor	one 18T)	Visibility	Test Day	Dete	Carcass	Signa of Securating	Tester	
Numb	r	Species	Turbine Base (m)	Turbine Base (°)	Easting	Northing	Class	Test Day	Date	Present	Signs of Scavenging	Tester
								Day 0	03-Sep-20	Y	Carcass placed	Searcher A
								Day 4	07-Sep-20	N	Carcass removed	Searcher A
1	S28	Hoary Bat	34	180	369097	4893096	1	Day 7	10-Sep-20	N	-	Searcher A
								Day 11	14-Sep-20	N	-	Searcher A
								Day 14	17-Sep-20	N	-	Searcher A

Fall (September/October) Continued

Carcass	Trucking	Orașia	Distance from	Direction from	UTM (Z	one 18T)	Visibility	Test Dev	Data	Carcass		Tester
Number	Turbine	Species	Turbine Base (m)	Turbine Base (°)	Easting	Northing	Class	Test Day	Date	Present	Signs of Scavenging	Tester
								Day 0	03-Sep-20	Y	Carcass placed	Searcher A
								Day 4	07-Sep-20	N	Carcass removed	Searcher A
2	S14	Black-billed Cuckoo	50	40	366822	4891200	2	Day 7	10-Sep-20	N	-	Searcher A
								Day 11	14-Sep-20	N	-	Searcher A
								Day 14	17-Sep-20	N	-	Searcher A
								Day 0	03-Sep-20	Y	Carcass placed	Searcher A
	000			0.40	000.174	4000440		Day 4	07-Sep-20	N	Carcass removed	Searcher A
3	S02	Eastern Red Bat	36	340	366474	4890413	2	Day 7	10-Sep-20	N	-	Searcher A
								Day 11	14-Sep-20	N	-	Searcher A
								Day 14	17-Sep-20	N	-	Searcher A
								Day 0	03-Sep-20	Y	Carcass placed	Searcher A
	000				004400	4000000		Day 4	07-Sep-20	Y	Only feathers remain	Searcher A
4	S22	Northern Parula	27	220	361436	4890629	2	Day 7	10-Sep-20	N	Carcass removed	Searcher A
								Day 11	14-Sep-20	N	-	Searcher A
								Day 14	17-Sep-20	N	-	Searcher A
								Day 0	03-Sep-20	Y	Carcass placed	Searcher A
								Day 4	07-Sep-20	Y	None	Searcher A
5	S05	Black-and-white Warbler	16	110	362680	4888873	1	Day 7	10-Sep-20	Y	Partially scavenged; some bones and feathers remain	Searcher A
								Day 11	14-Sep-20	N	Carcass removed	Searcher A
								Day 14	17-Sep-20	N	-	Searcher A
								Day 0	14-Sep-20	Y	Carcass placed	Searcher A
								Day 3	17-Sep-20	Y	None	Searcher A
6	S03	Silver-haired Bat	26	40	361267	4887462	2	Day 7	21-Sep-20	Y	None	Searcher A
								Day 10	24-Sep-20	Y	None	Searcher A
								Day 14	28-Sep-20	Y	None	Searcher A
								Day 0	14-Sep-20	Y	Carcass placed	Searcher A
								Day 3	17-Sep-20	N	Carcass removed	Searcher A
7	S36	Tree Swallow	2	340	364583	4888398	1	Day 7	21-Sep-20	N	-	Searcher A
								Day 10	24-Sep-20	N	-	Searcher A
								Day 14	28-Sep-20	N	-	Searcher A
								Day 0	14-Sep-20	Y	Carcass placed	Searcher A
								Day 3	17-Sep-20	Y	None	Searcher A
8	S02	Philadelphia Vireo	22	275	366465	4890369	1	Day 7	21-Sep-20	Y	None	Searcher A
								Day 10	24-Sep-20	Y	None	Searcher A
								Day 14	28-Sep-20	Y	None	Searcher A
								Day 0	14-Sep-20	Y	Carcass placed	Searcher A
								Day 3	17-Sep-20	N	Carcass removed	Searcher A
9	S07	Hoary Bat	44	195	366803	4891596	1	Day 7	21-Sep-20	N	-	Searcher A
								Day 10	24-Sep-20	N	-	Searcher A
								Day 14	28-Sep-20	N	-	Searcher A
								Day 0	14-Sep-20	Y	Carcass placed	Searcher A
								Day 3	17-Sep-20	N	Carcass removed	Searcher A
10	S28	Eastern Kingbird	12	250	369082	4893118	2	Day 7	21-Sep-20	N	-	Searcher A
								Day 10	24-Sep-20	N	-	Searcher A
								Day 14	28-Sep-20	N	-	Searcher A
								Day 0	01-Oct-20	Y	Carcass placed	Searcher A
	a : -	-	a			-	Day 4	05-Oct-20	Y	None	Searcher A
11	S05	Eastern Red Bat	8	235	362666	4888875	2	Day 7	08-Oct-20	Y	None	Searcher A
								Day 11	12-Oct-20	Y	None	Searcher E
						<u> </u>	<u> </u>	Day 14	15-Oct-20	Y	None	Searcher A
								Day 0	01-Oct-20	Y	Carcass placed	Searcher A
							l .	Day 4	05-Oct-20	N	Carcass removed	Searcher A
12	S01	Golden-crowned Kinglet	17	125	359186	4889542	1	Day 7	08-Oct-20	N	-	Searcher A
								Day 11	12-Oct-20	N	-	Searcher E
								Day 14	15-Oct-20	N	-	Searcher A

Fall (September/October) Continued

Carcass	Turking	Onesia	Distance from	Direction from	UTM (Z	one 18T)	Visibility	Test Davi	Data	Carcass		Tester
Number	Turbine	Species	Turbine Base (m)	Turbine Base (°)	Easting	Northing	Class	Test Day	Date	Present	Signs or Scavenging	Tester
								Day 0	01-Oct-20	Y	Carcass placed	Searcher A
								Day 4	05-Oct-20	N	Carcass removed	Searcher A
13	S28	Silver-haired Bat	47	160	369109	4893084	1	Day 7	08-Oct-20	N	-	Searcher A
								Day 11	12-Oct-20	N	-	Searcher E
								Day 14	15-Oct-20	N	-	Searcher A
								Day 0	01-Oct-20	Y	Carcass placed	Searcher A
								Day 4	05-Oct-20	Y	One wing remains	Searcher A
14	S07	European Starling	47	220	366783	4891601	2	Day 7	08-Oct-20	Y	No further signs	Searcher A
								Day 11	12-Oct-20	Y	No further signs	Searcher E
								Day 14	15-Oct-20	Y	No further signs	Searcher A
								Day 0	01-Oct-20	Y	Carcass placed	Searcher A
								Day 4	05-Oct-20	Y	None	Searcher A
15	S36	Red-eyed Vireo	28	340	364575	4888421	1	Day 7	08-Oct-20	N	Carcass removed	Searcher A
								Day 11	12-Oct-20	N	-	Searcher E
								Day 14	15-Oct-20	N	-	Searcher A

Raptor Trials

Winter 1 (January-April)

Carcass	Turking	Species	Distance from	Direction from	UTM (Zo	one 18T)	Visibility	Test Day	Data	Carcass	Signo of Securation	Tastar
Number	Turbine	Species	Turbine Base (m)	Turbine Base (°)	Easting	Northing	Class	Test Day	Date	Present	Signs of Scavenging	Tester
								0	15-Jan-20	Y	Carcass placed	Searcher A
								9	24-Jan-20	Y	None	Searcher A
1	S21	Peregrine Falcon	15	35	364887	4889054	1	14	29-Jan-20	Y	None	Searcher A
								20	4-Feb-20	Y	None	Searcher A
								28	12-Feb-20	Y	None	Searcher A
								0	15-Jan-20	Y	Carcass placed	Searcher A
								8	23-Jan-20	Y	None	Searcher A
2	S37	Red-tailed Hawk	38	10	365508	4889896	2	14	29-Jan-20	Y	None	Searcher A
								21	5-Feb-20	Y	None	Searcher A
								28	12-Feb-20	Y	None	Searcher A
								0	07-Feb-20	Y	Carcass placed	Searcher A
								5	12-Feb-20	Y	None	Searcher A
3	S30	Turkey Vulture	27	150	367049	4892914	2	14	21-Feb-20	Y	None	Searcher A
								21	28-Feb-20	Y	None	Searcher A
								28	6-Mar-20	Y	None	Searcher A
								0	07-Feb-20	Y	Carcass placed	Searcher A
								5	12-Feb-20	Y	None	Searcher A
4	S13	Turkey Vulture	32	30	367817	4891875	1	14	21-Feb-20	Y	None	Searcher A
								21	28-Feb-20	Y	None	Searcher A
								28	6-Mar-20	Y	None	Searcher A
								0	11-Mar-20	Y	Carcass placed	Searcher A
5	S31	Common Raven	49	35	362377	4891068	1	5	16-Mar-20	N	Carcass removed	Searcher A
								15	26-Mar-20	N	-	Searcher A
								0	11-Mar-20	Y	Carcass placed	Searcher A
								5	16-Mar-20	Y	None	Searcher A
6	S20	Common Raven	9	315	362885	4889250	2	15	26-Mar-20	Y	None	Searcher A
								50	30-Apr-20	Y	None	Searcher A
								58	8-May-20	Y	None	Searcher A

Spring/Summer/Fall (May-October)

Carcass	Turking	Creation	Distance from	Direction from	UTM (Z	one 18T)	Visibility	Test Day	Dete	Carcass	Signa of Securating	Tester
Number	Turbine	Species	Turbine Base (m)	Turbine Base (°)	Easting	Northing	Class	Test Day	Date	Present	Signs or Scavenging	Tester
								Day 0	11-May-20	Y	Carcass placed	Searcher A
								Day 3	14-May-20	Y	None	Searcher A
1	S22	Turkey Vulture	47	115	361492	4890636	2	Day 7	18-May-20	Y	None	Searcher A
								Day 10	21-May-20	Y	None	Searcher A
								Day 14	25-May-20	Y	None	Searcher A
								Day 0	11-May-20	Y	Carcass placed	Searcher A
								Day 3	14-May-20	Y	None	Searcher A
2	S07	Osprey	25	295	366786	4891638	1	Day 7	18-May-20	Y	None	Searcher A
								Day 10	21-May-20	Y	None	Searcher A
								Day 14	25-May-20	N	Carcass removed	Searcher A
								Day 0	01-Jun-20	Y	Carcass placed	Searcher A
								Day 3	04-Jun-20	N	Carcass removed	Searcher A
3	S28	Turkey Vulture	19	80	369108	4893131	1	Day 7	08-Jun-20	N	-	Searcher A
		-						Day 10	11-Jun-20	N	-	Searcher A
								Day 14	15-Jun-20	N	-	Searcher A
								Day 0	01-Jun-20	Y	Carcass placed	Searcher C
								Day 3	04-Jun-20	Y	None	Searcher C
4	S05	Peregrine Falcon	38	150	362717	4888966	2	Day 7	08-Jun-20	Y	None	Searcher C
		6						Day 10	11-Jun-20	Y	None	Searcher C
								Day 14	15-Jun-20	Y	None	Searcher C
								Day 0	02-Jul-20	Ý	Carcass placed	Searcher A
								Day 4	06-Jul-20	Ŷ	None	Searcher A
5	S14	Turkey Vulture	43	50	366818	4891195	2	Day 7	09-Jul-20	Y	None	Searcher A
-							_	Day 11	13-Jul-20	Ŷ	None	Searcher A
								Day 14	16-Jul-20	Y	None	Searcher A
								Day 14	02-Jul-20	Ŷ	Carcass placed	Searcher A
								Day 4	06-Jul-20	Y	None	Searcher A
6	S02	Red-tailed Hawk	24	265	366464	4890366	1	Day 7	09-101-20	Y	None	Searcher A
Ŭ	002			200	000101	1000000		Day 11	13- Jul-20	v	None	Searcher A
								Day 14	16-Jul-20	Y	None	Searcher A
								Day 14	03-Aug-20	V		Searcher A
								Day 0	06-Aug-20	V V	Nono	Searcher A
7	S05	Turkey Vulture	50	100	362712	4888881	2	Day 3	10-Aug-20	V V	None	Searcher A
,	000		00	100	002112	4000001	-	Day 1	13-Aug-20	I V	None	Searcher A
								Day 10	17-Aug-20	v v	None	Searcher A
								Day 14	03-Aug-20	V V		Searcher A
								Day 0	05-Aug-20	I V	Nono	Searcher A
8	503	Red-tailed Hawk	18	170	361261	4887421	1	Day 3	10 Aug 20	T V	Corosos moved 10m south	Searcher A
0	005	Red-tailed Hawk	10	170	301201	4007421		Day 7	12 Aug 20	I V	Calcass moved form south	Searcher A
								Day 10	13-Aug-20	T V	No further signs	Searcher A
						1		Day 14	07-Sop 20	I V		Searchor A
								Day 0	10 Sop 20	T	Varcass placed	Searcher A
٩	S01	Turkey Vulture	42	175	350108	4889510	1	Day 3	10-Sep-20	T V	None	Searcher A
3	001	Turkey Value	72	175	555150	4003313		Day 7	14-Sep-20	T N	Coroose removed	Searchar A
								Day 10	17-Sep-20	N	Calcass terrioved	Searcher A
	1					1	1	Day 14	07-Sop-20	V	- Carease placed	Searchor A
								Day 0	10-Sop-20	I V	Carcass moved 20m porthwest	Searcher A
10	526	Turkey Vulture	16	275	367358	4892530	2	Day 3	14-Sop 20	N		Searcher A
10	020	runey vuluie	10	215	307330	7032330	<u> </u>	Day 1	14-Sep-20	IN N		Searchor A
								Day 10	21-Sop-20	N	-	Searcher A
			1	1	1	1	1	Day 14	01 Oct 20		- Carease placed	Searcher A
								Day 0	01-001-20	I V	Nono	Searcher A
11	S14	Turkov Vulturo	46	50	366025	4801102	1	Day 4	05-Oct-20	T V	None	Searcher A
	014		40	30	300023	4031133		Day 7	10-UCT-20	T V	NONE	Searcher F
								Day 11	12-Oct-20	T V	None	Searcher A
1	1		1	1		1	1	Day 14	10-001-20	T	none	Searcher A

Spring/Summer/Fall (May-October) Continued

Carcass	Turking	Creation	Distance from	Direction from	UTM (Z	one 18T)	Visibility	Test Day	Dete	Carcass		Teeter
Number	Turbine	Species	Turbine Base (m)	Turbine Base (°)	Easting	Northing	Class	Test Day	Date	Present	Signs of Scavenging	rester
								Day 0	01-Oct-20	Y	Carcass placed	Searcher A
12 \$22	600	Mollard	26	95	261494	4800050	2	Day 4	05-Oct-20	Y	Partially scavenged (breast tissue removed)	Searcher A
12	12 S22	Mallard	30	CO	301464	4690659	2	Day 7	08-Oct-20	Y	No further signs	Searcher A
								Day 11	12-Oct-20	Y	No further signs	Searcher E
								Day 14	15-Oct-20	Y	No further signs	Searcher A

Winter 2 (November-December)

Carcass	Turking	Onesia	Distance from	Direction from	UTM (Z	one 18T)	Visibility	Test Dev	Data	Carcass		Tester
Number	Turbine	Species	Turbine Base (m)	Turbine Base (°)	Easting	Northing	Class	Test Day	Date	Present	Signs of Scavenging	Tester
								0	05-Nov-20	Y	Carcass placed	Searcher A
								7	12-Nov-20	Y	None	Searcher A
1	S28	Common Raven	50	165	369101	4893082	2	14	19-Nov-20	Y	None	Searcher A
								21	26-Nov-20	Y	None	Searcher A
								28	03-Dec-20	Y	None	Searcher A
								0	12-Nov-20	Y	Carcass placed	Searcher A
								7	19-Nov-20	Y	None	Searcher A
2	S05	Red-tailed Hawk	25	325	362657	4888904	1	14	26-Nov-20	Y	None	Searcher A
								19	01-Dec-20	Y	None	Searcher A
								28	10-Dec-20	Y	None	Searcher A
								0	03-Dec-20	Y	Carcass placed	Searcher A
								8	11-Dec-20	Y	None	Searcher A
3	S18	Turkey Vulture	27	145	367633	4892193	2	14	17-Dec-20	Y	None	Searcher A
								19	22-Dec-20	Y	None	Searcher A
								28	31-Dec-20	Y	None	Searcher A

Appendix III Searcher Efficiency Trial Results

Appendix III 2121C Amherst Island Wind Project 2020 Searcher Efficiency Trial Results

Spring 2020 Searcher Efficiency Trial - Searcher A

Date	Soarchor	No	Turbino	Spacios	Distance	Direction (°)	Gonoral Habitat	Visibility	UTM	(18T)	Found	Scavenged
Date	Searcher	NO.	Turbine	Species	(m)	Direction ()	General Habitat	Class	Easting	Northing	(Y/N)	(Y/N)
		1	S02	Brown Creeper	40	185	Mowed Grass	2	366492	4890335	Y	-
04-May-20	Searcher A	2	S07	Wilson's Snipe	22	110	Mowed Grass	2	366833	4891635	Y	-
		3	S28	Tree Swallow	10	260	Gravel	1	369085	4893120	Y	-
		4	S36	Eastern Red Bat	38	310	Mowed Grass	2	364551	4888404	Y	-
06-May-20	Searcher A	5	S03	Silver-haired Bat	25	160	Mowed Grass	2	361269	4887414	Ν	Ν
		6	S01	Hoary Bat	3	140	Concrete Turbine Base	1	359175	4889549	Y	-
11-May-20	Searcher A	7	S22	Wilson's Snipe	48	140	Mowed Grass	2	361497	4890637	Y	-
11-1viay-20	Searcher A	8	S14	Silver-haired Bat	45	50	Mowed Grass	2	366818	4891199	Ν	Ν
20 May 20	Soorobor A	9	S07	Eastern Red Bat	27	260	Mowed Grass	2	366782	4891630	Ν	Ν
20-1viay-20	Searcher A	10	S14	Golden-crowned Kinglet	13	120	Gravel	1	366800	4891159	Y	-
		11	S14	Cedar Waxwing	44	140	Mowed Grass	2	366836	4891148	Y	-
04-Jun-20	Searcher A	12	S07	Hoary Bat	33	220	Gravel	1	366794	4891609	Y	-
		13	S28	Red-eyed Vireo	23	100	Gravel	1	369113	4893130	Y	-
		14	S14	Eastern Red Bat	31	100	Gravel	1	366819	4891166	Y	-
08-Jun-20	Searcher A	15	S28	Golden-crowned Kinglet	33	20	Mowed Grass	2	369083	4893167	Y	-
		16	S28	Red-eyed Vireo	43	300	Mowed Grass	2	369044	4893134	Y	-
11 Jun 20	Soorobor A	17	S02	Song Sparrow	41	200	Gravel	1	366463	4890335	Y	-
11-30 11- 20	Searcher A	18	S14	Silver-haired Bat	15	80	Gravel	1	366799	4891190	Y	-
15 Jun 20	Searcher A	19	S02	Silver-haired Bat	7	200	Gravel	1	366495	4890362	Y	-
10-001-20	Searcher A	20	S07	Hoary Bat	41	340	Mowed Grass	2	366796	4891680	Y	-

Spring/Summer 2020 Searcher Efficiency Trial - Searcher C

Data	Soarchor	No	Turbino	Species	Distance	Direction (°)	Gonoral Habitat	Visibility	UTM	(18T)	Found	Scavenged
Date	Searcher	NO.	Turbine	Species	(m)	Direction ()	General Habitat	Class	Easting	Northing	(Y/N)	(Y/N)
		1	S22	Hoary Bat	33	195	Gravel	1	361447	4890621	Y	-
28-May-20	Searcher C	2	S01	American Woodcock	44	95	Mowed Grass	2	359214	4889555	Y	-
		3	S36	Red-eyed Vireo 2 60 Concrete Turbine Base 1 364589 Tree Swallow 19 65 Mowed Grass 2 361464 Song Sparrow 41 120 Gravel 1 361298	364589	488404	Y	-				
		4	S22	Tree Swallow 19 65 Mowed Grass 2 361464 4890 Song Sparrow 41 120 Gravel 1 361298 4887		4890667	Y	-				
01-Jun-20	un-20 Searcher C 4 S22 5 S03 6 S36 7 S05	5	S03	Song Sparrow	41	120	Gravel	1	361298	4887422	Y	-
		Eastern Red Bat	21	220	Mowed Grass	2	364580	4888380	Y	-		
		7	S05	Purple Martin	36	135	Mowed Grass	2	362695	4888859	Y	-
04-Jun-20	Searcher C	8	S01	Palm Warbler	25	180	Gravel	1	359178	4889527	Y	-
		9	S03	Silver-haired Bat	46	85	Mowed Grass	2	361300	4887451	Y	-
		10	S05	Red-eyed Vireo	21	350	Gravel	1	362663	4888901	Y	-
08-Jun-20	Searcher C	11	S22	Hoary Bat	41	185	Gravel	1	361448	4890615	Y	-
		12	S01	Cedar Waxwing	17	15	$\begin{array}{ c c c c c c } \hline \begin{tabular}{ c c c c } \hline & \hline UTM (18T) & \hline Found \\ \hline \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$					

Date	Searcher	No	Turbine	Species	Distance	Direction (°)	General Habitat	Visibility	UTM	l (18T)	Found	Scavenged
Date	Searcher	NO.	Turbine	Opecies	(m)	Direction ()	General Habitat	Class	Easting	Northing	(Y/N)	(Y/N)
		13	S05	Tree Swallow	32	225	Mowed Grass	2	362650	4888854	Ν	N
11-Jun-20	Searcher C	14	S22	Eastern Red Bat	41	95	Mowed Grass	2	361487	4890665	Y	-
		15	S03	Golden-crowned Kinglet	11	180	Gravel	1	361261	4887424	Y	-
		16	S22	Red-eyed Vireo	39	195	Gravel	1	361449	4890614	Y	-
15-Jun-20	Searcher C	17	S01	Silver-haired Bat	28	45	Mowed Grass	2	359187	4889572	Y	-
		18	S03	Golden-crowned Kinglet	2	210	Concrete Turbine Base	1	361259	4887432	Y	-
		19	S05	Swamp Sparrow	30	5	Mowed Grass	2	362670	4888910	Y	-
18-Jun-20	Searcher C	20	S22	Eastern Red Bat	13	110	Gravel	1	361456	4890648	Y	-
		21	S01	Red-eyed Vireo	28	245	Mowed Grass	2	359149	4889537	Y	-
		22	S22	Wilson's Snipe	14	320	Mowed Grass	2	361435	4890662	Ν	Ν
22-Jun-20	Searcher C	23	S01	Silver-haired Bat	49	120	Mowed Grass	2	359221	4889541	Y	-
		24	S03	Black-throated Green Warbler	42	125	Gravel	1	361300	4887427	Y	-
		25	S05	Hoary Bat	21	85	Gravel	1	362689	4888884	Y	-
25-Jun-20	Searcher C	26	S22	Red-eyed Vireo	7	230	Gravel	1	361448	4890646	Y	-
		27	S01	Killdeer	33	340	Mowed Grass	2	359160	4889585	Y	-
		28	S01	Hoary Bat	35	160	Gravel	1	359187	488519	N	Y
29-Jun-20	Searcher C	29	S03	European Starling	32	275	Mowed Grass	2	361230	4887441	Y	-
		30	S36	Black-throated Green Warbler	18	0	Gravel	1	364586	4888412	Y	-
		31	S36	Eastern Red Bat	37	20	Gravel	1	364595	4888436	Y	-
02-Jul-20	Searcher C	32	S03	European Starling	9	35	Gravel	1	361266	4887437	Y	-
		33	S22	Black-throated Green Warbler	31	205	Mowed Grass	2	361438	4880625	Y	-
		34	S05	Tree Swallow	20	240	Mowed Grass	2	362655	4888865	Y	-
06-Jul-20	Searcher C	35	S22	Eastern Red Bat	3	110	Concrete Turbine Base	1	361451	4890653	Y	-
		36	S01	Red-eyed Vireo	42	140	Gravel	1	359200	4889517	Y	-
		37	S05	Tree Swallow	27	75	Gravel	1	362695	4888890	Y	-
09-Jul-20	Searcher C	38	S36	Hoary Bat	43	335	Mowed Grass	2	364558	4888429	Y	-
		39	S03	Wilson's Snipe	37	130	Mowed Grass	2	361288	4887411	Y	-
Summer 20	020 Searcher	Efficier	ncy Trial- S	Searcher A								
					Distance			Visibility	UTM	l (18T)	Found	Scavenged
Date	Searcher	NO.	Turbine	Species	(m)	Direction (°)	General Habitat	Class	Easting	Northing	(Y/N)	(Y/N)
		1	S02	Tree Swallow	35	240	Mowed Grass	2	366459	4890357	Y	-
02-Jul-20	Searcher A	2	S14	Eastern Red Bat	27	40	Gravel	1	366810	4891181	Y	-
		3	S07	Golden-crowned Kinglet	44	220	Gravel	1	366791	4891598	Y	-
		4	S26	Eastern Red Bat	36	0	Mowed Grass	2	367359	4892588	Y	-
06-Jul-20	Searcher A	5	S28	Purple Martin	27	80	Mowed Grass	2	369117	4893139	Y	-
		6	S14	Silver-haired Bat	48	90	Gravel	1	366830	4891187	Y	-
		7	S26	Golden-crowned Kinglet	5	0	Concrete Turbine Base	1	367361	4892550	Y	-
09-Jul-20	Searcher A	8	S28	Hoary Bat	44	180	Mowed Grass 2 362650 488 Mowed Grass 2 361487 489 Gravel 1 361261 488 Gravel 1 361261 488 Gravel 1 361449 489 Mowed Grass 2 359187 488 Concrete Turbine Base 1 361259 488 Mowed Grass 2 359149 488 Gravel 1 361456 489 Mowed Grass 2 359149 488 Gravel 1 361435 489 Mowed Grass 2 359221 488 Gravel 1 361300 488 Gravel 1 361448 489 Mowed Grass 2 359160 488 Gravel 1 364586 488 Gravel 1 364586 488 Gravel 1 364586 488 Gravel 1 3664	4893089	Y	-		
		9	S07	Tree Swallow	27	240	Gravel	1	366708	4891623	Y	-
00.1.1.00		10	S03	Big Brown Bat	41	65	Mowed Grass	2	361291	4887462	N	N
29-Jul-20	Searcher A	11	S05	Tree Swallow	28	114	Mowed Grass	2	362696	4888877	Ν	Y

Spring/Summer 2020 Searcher Efficiency Trial - Searcher C Continued

Summer 2020 Searcher Efficiency Trial- Searcher A Continued

Data	Soarchor	No	Turbino	Spacios	Distance	Direction (°)	Gonoral Habitat	Visibility	UTM	(18T)	Found	Scavenged
Date	Searcher	NO.	Turbine	Species	(m)	Direction ()	General Habitat	Class	Easting	Northing	(Y/N)	(Y/N)
		12	S01	Mourning Dove	36	110	Mowed Grass	2	359203	4889549	N	Y
06-Aug-20	Searcher A	13	S22	Hoary Bat	15	320	Mowed Grass	2	361430	4880664	Ν	Ν
		14	S36	Northern Parula	43	20	Gravel	1	364594	4888446	Y	-
		15	S02	Black-billed Cuckoo	23	210	Gravel	1	366476	4890355	Y	-
13-Aug-20	Searcher A	16	S14	Hoary Bat	47	160	Mowed Grass	2	366841	4891168	Y	-
		17	S07	Hoary Bat		-						
		18	S03	American Woodcock	42	240	Mowed Grass	2	361227	4887410	Y	-
17-Aug-20	Searcher A	19	S28	Swamp Sparrow	24	70	Mowed Grass	2	369111	4893135	Y	-
		20	S26	Silver-haired Bat	6	45	Gravel	1	367375	4892538	Y	-
31-410-20	Searcher A	21	S05	Black-and-white Warbler	13	190	Mowed Grass	Class Easting Northing (Y/N) Other 2 359203 4889549 N Y 2 361430 4880664 N N 1 364594 4888466 Y - 1 366476 4890355 Y - 2 366841 4891168 Y - 1 366814 4891635 Y - 1 366814 4891355 Y - 2 361227 4887410 Y - 2 369111 4893135 Y - 1 367375 4892538 Y - 2 362668 4888870 Y - 2 359156 4889557 Y -				
51-Adg-20	Gearcher A	22	S01	Eastern Red Bat	16	285	Mowed Grass	2	359156	4889557	Found (Y/N) Scavenge (Y/N) N Y N N Y - Y - Y - Y - Y - Y - Y - Y - Y - Y - Y - Y - Y - Y - Y - Y - Y -	-

Fall 2020 Searcher Efficiency Trial- Searcher A

Data	Searcher	No	Turbine	Species	Distance	Direction (°)	General Habitat	Visibility	UTM	(18T)	Found	Scavenged
Date	Searcher	NO.	Turbine	Opecies	(m)	Direction ()	General Habitat	Class	Easting	Northing	(Y/N)	(Y/N)
		1	S02	European Starling	40	345	Mowed Weeds	2	366475	4890412	Y	-
03-Sep-20	Searcher A	2	S22	Red-eyed Vireo	28	215	Mowed Weeds	2	361436	4890630	Y	-
		3	S01	Eastern Red Bat	17	140	Gravel	1	359185	4889538	Y	-
		4	S28	Eastern Red Bat	8	110	Gravel	1	369098	4893125	Ν	Y
10-Sep-20	Searcher A	5	S14	Hoary Bat	42	130	Mowed Grass	2	366834	4891152	Y	-
		6	S07	Eastern Kingbird	9	90	Mowed Grass	2	366818	4891645	Y	-
		7	S36	Tree Swallow	48	5	Bare Ground	1	364586	488449	Y	-
17-Sep-20	Searcher A	8	S36	Swamp Sparrow	35	345	Bare Ground	1	364577	4888436	Y	-
		9	S05	Hoary Bat	31	350	Mowed Grass	2	362664	4888910	Ν	Ν
24-Sep-20	Searcher A	10	S28	Hoary Bat	15	140	Gravel	1	369103	4893131	Y	-
24 000 20	ocarcher A	11	S03	Eastern Red Bat	24	170	Mowed Grass	2	361264	4887413	Y	-
		12	S03	Red-breasted Nuthatch	18	90	Gravel	1	361269	4887418	N	Ν
30-Sep-20	Searcher A	13	S14	Hoary Bat	45	15	Gravel	1	366821	4891191	Y	-
		14	S26	Eastern Red Bat	13	330	Mowed Grass	2	367374	4892554	Ν	Y
		15	S02	Hoary Bat	43	295	Mowed Weeds	2	366446	4890384	Y	-
08-Oct-20	Searcher A	16	S22	Tree Swallow	48	45	Mowed Weeds	2	361474	4890698	Y	-
		17	S01	Black-throated Green Warbler	22	130	Gravel	1	359190	4889539	Y	-
		18	S05	Hoary Bat	7	110	Mowed Grass	2	362666	4888877	Y	-
15-Oct-20	Searcher A	19	S07	Hoary Bat	21	180	Gravel	1	366820	4891619	Y	-
		20	S26	Black-throated Green Warbler	33	0	Mowed Grass	2	367380	4892571	Ν	Y
		21	S07	Hoary Bat	48	160	Gravel	1	366790	4891599	Y	-
22-Oct-20	Searcher A	22	S14	Hoary Bat	24	290	Mowed Grass	2	366800	4891183	Y	-
		23	S36	Golden-crowned Kinglet	15	330	Gravel	1	364584	4888408	round Scaveny g (Y/N) 2 Y 0 Y 3 Y 5 N 7 Y 6 Y 7 Y 6 Y 7 Y 8 N 1 Y 3 Y 3 Y 3 Y 3 Y 3 Y 3 Y 3 Y 3 Y 6 Y 7 Y 9 Y 9 Y 9 Y 9 Y 9 Y 9 Y 9 Y 9 Y 7 P 7 Y 7 Y 7 Y 7	-

Appendix IV Avian Mortalities Appendix IV 2121C Amherst Island Wind Project

2020 Avian Mortalities

Visibility Class: 1 ≥90% bare ground, vegetation ≤15cm tall

2 ≥25% bare ground, vegetation ≤15cm tall

3 ≤25% bare ground, ≤25% of vegetation is >30cm tall

4 little or no bare ground, ≥ 25% of vegetation is >30cm tall

E Early decomposition M Moderate decomposition

A Advanced decomposition

C Complete decomposition

S Scavenged

Date	Turbine	Start Time	End Time	Dog Used (Y/N)	Days Since Last Search	Temp.	Cloud Cover (%)	Precipitation	Wind Speed (Beaufort Scale)	Wind Direction	Species	Sample ID	Sex (M/F/U)	Easting	Northing	Distance from Turbine (m)	Direction from Turbine (°)	Condition Code	Estimated Time Since Death (hrs)	Observed Injuries	Substrate/ Habitat	Visibility Class
4-May-20	S03	12:30	13:00	Ν	4	8	100	None	3	NW	European Starling	2121C-040520-S03-01	U	361245	4887431	11	320	E	96	Broken right wing	Bare ground	1
7-May-20	S05	8:05	8:35	Ν	3	9	50	None	4	NW	Black-throated Green Warbler	2121C-070520-S05-01	М	362663	4888885	2	310	F	48	Broken right wing	Concrete Turbine Base	1
7-May-20	S26	14:35	15:05	Ν	3	9	50	None	4	NW	Wilson's Snipe	2121C-070520-S26-01	U	367396	4892541	24	100	s	240	Only right wing remains	Gravel	1
7-May-20	S26	14:35	15:05	Ν	3	9	50	None	4	NW	Wild Turkey	2121C-070520-S26-02	U	367366	4892564	28	10	s	720	Only feathers remain	Mowed Weeds	2
21-May-20	S02	15:00	15:30	Ν	3	15	10	None	3	s	Passerine sp.	2121C-210520-S02-01	U	366458	4890336	48	220	s	72	Only left wing remains	Gravel	1
15-Jun-20	S28	12:25	12:55	Ν	4	20	10	None	3	E	Purple Martin	2121C-150620-S28-02	U	369075	4893145	22	330	F	48	Broken neck	Mowed Grass	2
18-Jun-20	S36	9:50	10:20	Ν	3	20	10	None	1	S	Bobolink	2121C-180620-S36-01	М	364588	4888397	1	280	F	5	Broken neck	Concrete Turbine Base	1
29-Jun-20	S14	13:55	14:25	Ν	4	24	30	None	2	S	Tree Swallow	2121C-290620-S14-01	U	366830	4891171	42	90	М	96	None apparent	Gravel	1
29-Jun-20	S14	13:55	14:25	Ν	4	24	30	None	2	s	Tree Swallow	2121C-290620-S14-02	U	366771	4891155	20	260	F	8	Broken neck	Mowed Grass	2
29-Jun-20	S02	14:40	15:10	Ν	4	24	30	None	2	s	Tree Swallow	2121C-290620-S02-01	U	366485	4890388	14	10	F	6	Broken neck	Mowed Grass	2
29-Jun-20	S03	13:30	14:00	Ν	4	26	25	None	1	SE	Passerine sp.	2121C-290620-S03-01	U	361236	4887398	42	220	s	24	Only feathers remain	Mowed Grass	2
2-Jul-20	S36	11:12	11:42	Ν	3	31	10	None	1	NW	Tree Swallow	2121C-020720-S36-01	U	364621	4888435	50	40	F	2	Blood on bill	Mowed Grass	2
6-Jul-20	S28	12:05	12:35	Ν	4	28	10	None	2	SE	Tree Swallow	2121C-060720-S28-02	U	369120	4893159	41	55	E	48	Broken skull	Mowed Grass	2
6-Jul-20	S02	14:15	14:45	Ν	4	28	10	None	2	SE	Tree Swallow	2121C-060720-S02-01	U	366491	4890347	25	170	F	24	Laceration on left leg	Gravel	1
16-Jul-20	S02	11:00	11:30	Ν	3	24	80	None	4	s	Tree Swallow	2121C-160720-S02-01	U	366490	4890375	2	20	F	18	Broken neck	Concrete Turbine Base	1
23-Jul-20	S36	8:43	9:13	Ν	3	21	90	None	2	Ν	Barn Swallow	2121C-230720-S36-01	U	364561	4888376	31	260	М	48	Broken wing	Mowed Grass	2
27-Jul-20	S02	10:50	11:20	Ν	4	27	50	None	3	W	Marsh Wren	2121C-270720-S02-01	U	366502	4890384	19	45	F	24	None apparent	Mowed Grass	2
30-Jul-20	S28	13:25	13:55	Ν	3	24	20	None	2	w	Purple Martin	2121C-300720-S28-01	U	369102	4893155	28	30	F	24	Abdominal laceration	Mowed Grass	2
30-Jul-20	S26	14:10	14:40	Ν	3	24	20	None	2	W	Bobolink	2121C-300720-S26-03	U	367399	4892567	39	70	F	12	Broken right wing	Mowed Grass	2
6-Aug-20	S02	11:35	12:05	Ν	3	22	10	None	3	NW	Purple Martin	2121C-060820-S02-01	U	366517	4890341	43	160	F	6	None apparent	Mowed Grass	2
6-Aug-20	S02	11:35	12:05	Ν	3	22	10	None	3	NW	Tree Swallow	2121C-060820-S02-02	U	366513	4890403	34	50	F	6	Bulging right eye	Mowed Grass	2
10-Aug-20	S36	11:10	11:40	Ν	4	22	90	None	1	W	Bobolink	2121C-100820-S36-01	U	364571	4888413	20	300	E	48	None apparent	Gravel	1
10-Aug-20	S14	13:10	13:40	Ν	4	22	90	None	1	w	Killdeer	2121C-100820-S14-01	U	366776	4891137	25	225	s	72	Only legs, wing bones, and feathers remain	Mowed Grass	2
20/Aug/20	S03	9:35	10:05	Ν	3	25	60	None	3	W	Blackburnian Warbler	2121C-200820-S03-01	U	361210	4887443	50	295	F	6	None apparent	Mowed Grass	2
24/Aug/20	S36	11:15	11:45	Ν	4	24	80	None	3	W	Vireo sp.	2121C-240820-S36-01	U	364596	4888430	29	15	А	168	None apparent (decomposed)	Gravel	1
24/Aug/20	S05	13:15	13:45	Ν	4	24	80	None	3	W	European Starling	2121C-240820-S05-01	U	362673	4888876	8	140	F	24	Cut in half	Mowed Grass	2
7/Sep/20	S02	11:10	11:40	Ν	4	21	100	Rain	5	SW	Eastern Kingbird	2121C-070920-S02-01	U	366494	4890381	3	35	F	24	Broken neck, bloody back	Gravel	1
10/Sep/20	S36	11:15	11:45	Ν	3	15	100	Fog	1	Ν	Philadelphia Vireo	2121C-100920-S36-01	U	364556	4888388	32	275	F	24	Rump laceration	Mowed Grass	2
17/Sep/20	S03	13:55	14:25	Ν	3	14	80	None	2	NE	Northern Parula	2121C-170920-S03-01	U	361215	4887419	45	270	E	72	Broken neck	Mowed Grass	2
21/Sep/20	S02	13:15	13:45	Ν	4	4	10	None	2	s	Red-eyed Vireo	2121C-210920-S02-01	U	366467	4890396	30	330	E	72	Exposed skull	Mowed Grass	2
28/Sep/20	S22	14:00	14:30	Ν	4	20	60	None	3	SW	Red-breasted Nuthatch	2121C-280920-S22-01	U	361415	4890694	50	320	М	96	None apparent (decomposed)	Mowed Grass	2
1/Oct/20	S22	8:00	8:30	Ν	3	14	50	None	5	w	Black-throated Blue Warbler	2121C-011020-S22-01	М	361484	4890659	36	85	E	48	Broken right wing	Mowed Grass	2
19/Oct/20	S14	12:50	13:20	Ν	4	7	100	Rain	2	NE	Golden-crowned Kinglet	2121C-191020-S14-01	U	366764	4891143	31	245	E	72	Broken tail and abdomen	Mowed Grass	2
22/Oct/20	S22	9:40	10:10	Ν	3	10	100	Rain	1	Ν	Golden-crowned Kinglet	2121C-221020-S22-01	М	361427	4890653	20	260	E	72	Broken skull	Mowed Weeds	2
22/Oct/20	S03	11:10	11:40	Ν	3	10	100	Rain	1	N	Golden-crowned Kinglet	2121C-221020-S03-01	М	361240	4887414	26	225	s	168	Only wings remain	Mowed Grass	2
22/Oct/20	S03	11:10	11:40	Ν	3	10	100	Rain	1	N	Golden-crowned Kinglet	2121C-221020-S03-02	М	361226	4887425	29	265	E	48	None apparent	Mowed Grass	2
22/Oct/20	S36	12:00	12:30	Ν	3	10	100	Rain	1	Ν	Golden-crowned Kinglet	2121C-221020-S36-01	U	364616	4888408	32	70	S	168	Only left wing remains	Mowed Grass	2
22/Oct/20	S36	12:00	12:30	Ν	3	10	100	Rain	1	Ν	Golden-crowned Kinglet	2121C-221020-S36-03	F	364559	4888377	36	240	E	72	Broken left wing	Mowed Grass	2
29/Oct/20	S05	14:50	15:20	N	3	6	80	None	2	Е	European Starling	2121C-291020-S05-01	U	362671	4888879	1	125	F	48	Broken neck	Concrete	1

Condition Code: I Injured or dying F Freshly dead

2020 Raptor 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	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
5-May-20	S11	10:05	10:35	N	30	4	10	None	2	SW	Turkey Vulture	2121C-050520-S11-02	U	361613	4887215	26	305	E	192	Cut in half (top)	Bare ground	1
8-May-20	S37	9:00	9:30	N	40	3	20	None	4	w	Osprey	2121C-080520-S37-01	U	365537	4889835	43	125	F	48	Broken neck	Mowed Grass	2
4-Jun-20	S26	11:50	12:20	N	3	18	70	None	3	SW	Turkey Vulture	2121C-040620-S26-01	U	367392	4892508	31	170	F	48	Abdominal laceration, broken left leg	Mowed Grass	2
27-Aug-20	S22	8:10	8:40	N	3	18	100	None	2	SW	Turkey Vulture	2121C-270820-S22-01	U	361420	4890682	39	320	м	72	Broken neck, bloody	Mowed Grass	2
5-Nov-20	S03	11:30	11:50	N	7	13	30	None	4	w	Red-tailed Hawk	2121C-051120-S03-01	U	361252	4887421	14	200	F	48	Left leg amputated	Mowed Grass	2

2020 Avian Mortalities Outside the Estimation Parameters

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	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
6-Mar-20	S29	N/A	9:50	N	7	1	90	None	5	E	European Starling	2121B-060320-S29-01	U	359578	4889897	22	140	F	36	Neck laceration and broken skull	Bare ground	1
26-Mar-20	S03	13:15	13:35	Ν	7	7	60	None	3	S	Killdeer	2121C-260320-S03-01	U	361237	4887413	30	220	F	4	Broken neck	Mowed Grass	2
27-Mar-20	S26	8:30	8:50	Ν	7	0	90	None	3	N	European Starling	2121C-270320-S26-01	U	367378	4892541	7	30	F	48	Broken neck	Gravel	1
2-Apr-20	S14	12:20	12:40	N	7	5	10	None	2	N	Golden-crowned Kinglet	2121C-020420-S14-01	м	366812	4891179	27	60	F	72	Broken left wing	Gravel	1
14-Apr-20	S28	13:05	13:25	Ν	12	5	50	None	4	NW	American Woodcock	2121C-140420-S28-01	U	369096	4893134	3	55	E	120	Broken neck	Concrete Turbine Base	1
23-Apr-20	S22	9:40	10:00	N	6	3	0	None	2	E	Golden-crowned Kinglet	2121C-230420-S22-01	F	361481	4890677	38	65	E	96	Broken left wing	Mowed Grass	2
23-Apr-20	S36	11:25	11:45	Ν	6	3	0	None	2	Е	Sora	2121C-230420-S36-01	U	364599	4888443	40	15	F	48	Laceration right side	Gravel	1
30-Apr-20	S14	14:55	15:15	N	7	10	100	Rain	2	SW	Golden-crowned Kinglet	2121C-300420-S14-01	м	366836	4891164	45	105	А	168	Only wings remain	Mowed Grass	2
12-May-20	S21	10:05	10:35	Ν	45	7	20	None	3	NW	Mourning Dove	2121C-120520-S21-02	U	364881	4889032	6	265	S	240	Scavenged	Gravel	1
12-May-20	S31	11:30	12:00	N	45	7	20	None	3	NW	Mourning Dove	2121C-120520-S31-01	U	362366	4891039	22	60	А	720	Decapitated	Gravel	1
12-Jun-20	S30	11:05	11:35	Ν	30	17	10	None	5	w	Killdeer	2121C-120620-S30-01	U	367039	4892929	12	215	м	720	Broken neck	Bare ground	1
7-Jul-20	S27	N/A	10:00	N	N/A	25	10	None	3	SW	Eastern Kingbird	2121C-070720-S27-01	U	365914	4890141	5	210	F	12	Lacerated abdomen	Gravel	1
17-Jul-20	S09	9:45	10:15	N	30	25	60	None	3	NW	Barn Swallow	2121C-170720-S09-01	U	360962	4887114	12	40	м	336	Partially severed head	Gravel	1
7-Aug-20	S21	12:55	13:25	N	30	24	10	None	2	E	Ring-billed Gull	2121C-070820-S21-01	U	364881	4889061	21	320	м	360	None observed	Gravel	1
14/Aug/20	S20	12:15	12:45	N	30	28	20	None	2	E	Mourning Dove	2121C-140820-S20-01	U	362891	4889256	2	265	А	720	None observed	Gravel	1
14/Oct/20	S20	11:30	12:00	N	30	14	5	None	2	NW	Golden-crowned Kinglet	212C-141020-S20-01	F	362863	4889276	41	325	F	24	None observed	Gravel	1
28/Oct/20	S13	9:30	10:00	N	30	2	90	None	2	NW	Golden-crowned Kinglet	2121C-281020-S13-01	U	367805	4891867	25	0	s	336	Only right wing remains	Mowed Grass	3
5/Nov/20	S01	12:10	12:30	Ν	7	13	30	None	4	w	Dark-eyed Junco	2121C-051120-S01-01	U	359152	4889563	22	310	S	120	Partially scavenged	Mowed Grass	2

Appendix V Bat Mortalities Appendix V 2121C Amherst Island Wind Project

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

F Freshly dead

E Early decomposition

M Moderate decomposition A Advanced decomposition

C Complete decomposition

S Scavenged

2020 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
4-May-20	S05	10:15	10:45	Ν	4	8	100	None	3	NW	Silver-haired Bat	2121C-040520-S05-01	43	F	362696	4888921	49	31	F	12	Broken left forearm	Gravel	1
25-May-20	S07	13:10	13:40	Ν	4	17	100	None	4	S	Big Brown Bat	2121C-250520-S07-01	48	F	366783	4891666	35	330	F	12	Ripped left wing	Mowed Grass	2
4-Jun-20	S26	11:50	12:20	Ν	3	18	70	None	3	SW	Hoary Bat	2121C-040620-S26-01	53	U	367381	4892561	24	30	А	708	None apparent (decomposed)	Mowed Grass	2
4-Jun-20	S03	15:39	16:09	Ν	3	16	50	None	3	SW	Big Brown Bat	2121C-040620-S03-01	44	М	361226	4887460	36	300	F	16	Abdominal laceration	Gravel	1
11-Jun-20	S03	15:20	15:50	Ν	3	19	50	None	6	W	Silver-haired Bat	2121C-110620-S03-01	40	М	361264	4887458	24	20	F	12	Broken wing	Mowed Grass	2
15-Jun-20	S22	13:18	13:48	Ν	4	21	10	None	3	NE	Little Brown Myotis	2121C-150620-S22-01	38	F	361446	4890650	5	210	F	12	None apparent	Gravel	1
22-Jun-20	S05	11:22	11:52	Ν	4	23	10	None	3	S	Silver-haired Bat	2121C-220620-S05-01	39	U	362714	4888864	49	110	М	84	None apparent	Gravel	1
22-Jun-20	S05	11:22	11:52	Ν	4	23	10	None	3	S	Silver-haired Bat	2121C-220620-S05-02	39	М	362668	4888916	35	0	F	12	Spinal injury	Gravel	1
29-Jun-20	S22	11:28	11:58	Ν	4	26	25	None	1	SE	Hoary Bat	2121C-290620-S22-01	54	U	361486	4890653	21	120	S	132	Only wings and fur remain	Mowed Grass	2
13-Jul-20	S22	8:50	9:20	Ν	4	24	80	Rain	3	E	Eastern Red Bat	2121C-130720-S22-01	40	М	361428	4890682	26	325	F	12	Blood in mouth	Mowed Grass	2
13-Jul-20	S07	12:40	13:10	Ν	4	24	80	Rain	3	E	Hoary Bat	2121C-130720-S07-01	55	U	366777	4891637	34	270	F	12	Broken left wing	Mowed Grass	2
16-Jul-20	S07	11:45	12:15	Ν	3	24	80	None	4	S	Hoary Bat	2121C-160720-S07-01	56	U	366808	4891646	10	345	м	132	Broken left wing	Mowed Weeds	2
16-Jul-20	S14	12:20	12:50	Ν	3	24	80	None	4	S	Big Brown Bat	2121C-160720-S14-01	45	М	366804	4891118	42	180	E	48	Abdominal laceration	Mowed Grass	2
20-Jul-20	S26	12:32	13:02	Ν	4	24	25	None	2	W	Hoary Bat	2121C-200720-S26-01	55	U	367365	4892532	5	265	м	60	None apparent	Gravel	1
30-Jul-20	S02	11:20	11:50	Ν	3	24	20	None	2	W	Hoary Bat	2121C-300720-S02-01	56	U	366534	4890358	47	95	F	24	Broken left wing	Gravel	1
30-Jul-20	S26	14:10	14:40	Ν	3	24	20	None	2	W	Big Brown Bat	2121C-300720-S26-02	45	М	367354	4892578	45	345	F	24	Abdominal laceration	Mowed Grass	2
3-Aug-20	S01	8:45	9:15	Ν	4	22	20	None	4	Ν	Hoary Bat	2121C-030820-S01-01	55	М	359175	4889586	32	25	F	12	Broken left wing	Mowed Grass and Gravel	2
3-Aug-20	S36	10:40	11:10	Ν	4	22	20	None	4	Ν	Big Brown Bat	2121C-030820-S36-01	46	М	364580	4888354	43	190	А	96	None apparent (decomposed)	Mowed Grass	2
3-Aug-20	S02	11:30	12:00	Ν	4	22	20	None	4	Ν	Eastern Red Bat	2121C-030820-S02-01	39	U	366496	4890364	13	150	м	60	Ventral laceration	Gravel	1
3-Aug-20	S28	13:35	14:05	Ν	4	22	20	None	4	Ν	Hoary Bat	2121C-030820-S28-01	54	U	369095	4893111	17	165	F	12	Broken left wrist, back laceration	Gravel	1
6-Aug-20	S01	9:00	9:30	Ν	3	22	10	None	3	NW	Big Brown Bat	2121C-060820-S01-01	46	М	359173	4889548	1	160	F	12	None apparent	Concrete Turbine Base	1
6-Aug-20	S14	13:10	13:40	Ν	3	22	10	None	3	NW	Hoary Bat	2121C-060820-S14-01	53	М	366837	4891173	46	90	F	12	None apparent	Gravel	1
6-Aug-20	S14	13:10	13:40	N	3	22	10	None	3	NW	Hoary Bat	2121C-060820-S14-02	54	М	366819	4891158	27	115	F	12	Broken spine	Gravel	1
10-Aug-20	S03	10:15	10:45	N	4	22	90	None	1	W	Hoary Bat	2121C-100820-S03-01	54	U	361287	4887397	48	145	F	12	None apparent	Mowed Grass	2
13-Aug-20	S05	7:25	7:55	Ν	3	23	20	None	2	SW	Big Brown Bat	2121C-130820-S05-01	45	U	362668	4888917	36	0	М	60	Broken left wing	Mowed Grass	2
13-Aug-20	S03	9:45	10:15	Ν	3	23	20	None	2	SW	Eastern Red Bat	2121C-130820-S03-01	39	U	361278	4887457	30	55	М	60	None apparent	Mowed Grass	2
13-Aug-20	S03	9:45	10:15	N	3	23	20	None	2	SW	Big Brown Bat	2121C-130820-S03-2	42	М	361278	4887473	43	45	F	12	None apparent	Mowed Grass	2
13-Aug-20	S36	10:45	11:15	Ν	3	23	20	None	2	SW	Hoary Bat	2121C-130820-S36-01	56	U	364575	4888424	26	355	F	12	None apparent	Gravel	1
13-Aug-20	S26	14:45	15:15	N	3	23	20	None	2	SW	Hoary Bat	2121C-130820-S26-01	57	U	367363	4892583	48	350	F	12	Broken right wing	Mowed Grass	2
17-Aug-20	S05	7:15	7:45	N	4	24	80	None	3	NW	Hoary Bat	2121C-170820-S05-01	57	U	362668	4888843	35	175	E	36	None apparent	Mowed Grass	2
17-Aug-20	S36	10:55	11:25	Ν	4	24	80	None	3	NW	Big Brown Bat	2121C-170820-S36-01	46	U	364591	4888422	22	20	м	84	Run over	Gravel	1
17-Aug-20	S28	13:40	14:10	Ν	4	24	80	None	3	NW	Hoary Bat	2121C-170820-S28-01	54	U	369095	4893099	29	185	м	84	None apparent	Mowed Grass	2
20-Aug-20	S26	11:50	12:20	Ν	3	25	60	None	3	W	Big Brown Bat	2121C-200820-S26-01	47	U	367388	4892537	18	90	м	60	None apparent	Gravel	1
20-Aug-20	S14	14:05	14:35	Ν	3	25	60	None	3	W	Big Brown Bat	2121C-200820-S14-01	43	U	366797	4891167	10	30	М	60	Broken right wing	Gravel	1
27-Aug-20	S01	9:05	9:35	N	3	18	100	Rain	2	SW	Silver-haired Bat	2121C-270820-S01-01	40	U	359195	4889562	21	70	А	156	Only bones and wings	Mowed Grass	2
27-Aug-20	S01	9:05	9:35	N	3	18	100	Rain	2	SW	Silver-haired Bat	2121C-270820-S01-02	42	U	359210	4889583	50	50	F	24	Broken left wing	Mowed Grass	2
31-Aug-20	S28	8:15	8:45	N	4	18	5	None	2	E	Silver-haired Bat	2121C-310820-S28-01	43	М	369113	4893101	38	160	F	12	None apparent	Gravel	1
31-Aug-20	S02	10:30	11:00	N	4	18	5	None	2	E	Silver-haired Bat	2121C-310820-S02-01	40	U	366495	4890363	15	170	F	24	Broken right wing, back	Gravel	1
3-Sep-20	S05	16:15	16:45	N	3	25	40	None	3	NW	Eastern Red Bat	2121C-030920-S05-01	39	U	362707	4888912	50	35	А	180	Run over	Gravel	1
7-Sep-20	S05	7:20	7:50	N	4	21	100	Rain	5	SW	Silver-haired Bat	2121C-070920-S05-01	43	U	362657	4888891	15	345	F	8	None apparent	Gravel	1
7-Sep-20	S22	8:05	8:35	N	4	21	100	Rain	5	SW	Hoary Bat	2121C-070920-S22-01	54	U	361436	4890638	21	210	F	8	None apparent	Mowed Grass	2

Condition Code: I Injured or dying

2020 Bat Mortalities Continued

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-Sep-20	S01	9:05	9:35	Ν	3	15	100	Fog	1	И	Silver-haired Bat	2121C-100920-S01-01	40	м	359182	4889532	25	140	F	12	Broken right wing	Gravel	1
10-Sep-20	S36	11:15	11:45	Ν	3	15	100	Fog	1	и	Silver-haired Bat	2121C-100920-S36-01	42	U	364577	4888409	17	310	1	-	Alive, no injuries apparent	Gravel	1
10-Sep-20	S02	12:10	12:40	Ν	3	15	100	Fog	1	Ν	Silver-haired Bat	2121C-100920-S02-01	41	U	366469	4890368	22	270	E	36	Broken right wing	Gravel	1
17-Sep-20	S22	12:25	12:55	Ν	3	14	80	None	2	NE	Silver-haired Bat	2121C-170920-S22-01	41	U	361442	4890655	0.1	280	E	36	None apparent	Turbine fans	1
28-Sep-20	S02	10:20	10:50	Ν	4	20	60	None	3	SW	Eastern Red Bat	2121C-280920-S02-01	40	U	366503	4890358	21	175	E	36	None apparent	Gravel	1

Appendix VI Locations of Bird and Bat Mortalities



Path: X:\2121_AmherstIslandWP\NRSI_2121C_AppendVI_TurbineMortalities2020_2021_03_16_GCS.mxd



Path: X:\2121_AmherstIslandWP\NRSI_2121C_AppendVI_TurbineMortalities2020_2021_03_16_GCS.mxd




















Appendix VII Visibility Class Mapping



≥ 90% bare ground; vegetation ≤ 15cm tall	
≥ 25% bare ground; vegetation ≤ 15cm tall	
≤ 25% bare ground; less than 25% of veg. > 30cm tall	
Little or no bare ground; more than 25% of veg. > 30cm tall	
Dense shrubs, woods, or other unsearchable habitats	
	 ≥ 90% bare ground; vegetation ≤ 15cm tall ≥ 25% bare ground; vegetation ≤ 15cm tall ≤ 25% bare ground; less than 25% of veg. > 30cm tall Little or no bare ground; more than 25% of veg. > 30cm tall Dense shrubs, woods, or other unsearchable habitats



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	
Class 4 Not Searchable	Little or no bare ground; more than 25% of veg. > 30cm tall Dense shrubs, woods, or other unsearchable habitats	

Page 2 of ____

Visibility Class Map Project Name: Amherst Toland up Project #: 21210 Turbine #: 50 Degree of Slope +0.5 degrees Slope Orientation N _ (e.g. SSW) Photo Numbers (from turbine base) Date (DD/MM/YY): 20107120 Photo Numbers (from turbine base) Date (DD/MM/YY): 18106120 Facing North: 2231 Facing North: 280701 Facing East: 2990 Facing East: 1807 Observer: 14B Facing South: Observer: Laura Lo. 2003 2801 Facing South: Facing West: 0924 28614 Facing West: (sketch habitat and visibility classes) Monthly/Seasonal Monthly/Seasonal N (sketch habitat and visibility classes) Ν Linear Transect Width: 5 Linear Transect Width: Geo UL2 20 VCL 5005 el giass 50m 40m 30m 20m 50m 30m 40m 20m 10m 10m torard -Re. gravet JUL gravel

General Habitat Description: tree

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	

rarouse

General Habitat Description:

Hanfield w/ sporse trees

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arass

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≥ 90% bare ground; vegetation ≤ 15cm tall	
≥ 25% bare ground; vegetation ≤ 15cm tall	
≤ 25% bare ground; less than 25% of veg. > 30cm tall	
Little or no bare ground; more than 25% of veg. > 30cm tall	
Dense shrubs, woods, or other unsearchable habitats	
	 ≥ 90% bare ground; vegetation ≤ 15cm tall ≥ 25% bare ground; vegetation ≤ 15cm tall ≤ 25% bare ground; less than 25% of veg. > 30cm tall Little or no bare ground; more than 25% of veg. > 30cm tall Dense shrubs, woods, or other unsearchable habitats

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Dense shrubs, woods, or other unsearchable habitats

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Class 4

Not Searchable

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Not Searchable

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Dense shrubs, woods, or other unsearchable habitats

Class 4

Not Searchable



≥ 90% bare ground; vegetation ≤ 15cm tall	-
≥ 25% bare ground; vegetation ≤ 15cm tall	
≤ 25% bare ground; less than 25% of veg. > 30cm tall	
Little or no bare ground; more than 25% of veg. > 30cm tall	
Dense shrubs, woods, or other unsearchable habitats	-
	 ≥ 90% bare ground; vegetation ≤ 15cm tall ≥ 25% bare ground; vegetation ≤ 15cm tall ≤ 25% bare ground; less than 25% of veg. > 30cm tall Little or no bare ground; more than 25% of veg. > 30cm tall Dense shrubs, woods, or other unsearchable habitats

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VISIBILITY CLASSES		
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tail	
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall	_
	< 25% bare ground: less than 25% of veg. > 30cm tall	
Class 3	Little or so hare ground: more than 25% of yeg. > 30cm tall	
Class 4	Little of no bale ground, more than 20 % of tog.	-
Not Searchable	Dense shrubs, woods, or other unsearchable habitats	

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VIOIDILITT OF COLO	to post have around upgotation < 15cm tall	
Class 1	2 90% bare ground; vegetation s ischi tali	
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	

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VISIBILITT 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	
the second se		

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sibility Class Map roject Name: Amberst Island UP Project #: 2121C Turbine #: 503 Degree of Slope + 2 degrees Slope Orientation SW (e.g. SSW) Photo Numbers (from turbine base) Date (DD/MM/YY):25105120 Date (DD/MM/YY): 30104 120 Photo Numbers (from turbine base) Facing North: Facing North: 1217 Facing East: 1319 Facing East: Observer: JAB Facing South: Observer: __YB Facing South: Facing West: 1320 Facing West: (sketch habitat and visibility classes) Monthly/Seasonal Monthly/Seasonal (sketch habitat and visibility classes) Ν Ν Linear Transect Width: Linear Transect Width: 5 m VC2 gravel ver grave 30m 50m 40m 20m 50m 30m 20m 10n 40m 1,0m concrete velactioneté ICE 100 SNOT gras General Habitat Description: General Habitat Description: heraerows herdrerows VISIBILITY CLASSES

≥ 90% bare ground; vegetation ≤ 15cm tall	
≥ 25% bare ground; vegetation ≤ 15cm tall	
≤ 25% bare ground; less than 25% of veg. > 30cm tall	
Little or no bare ground; more than 25% of veg. > 30cm tall	
Dense shrubs, woods, or other unsearchable habitats	
	 ≥ 90% bare ground; vegetation ≤ 15cm tall ≥ 25% bare ground; vegetation ≤ 15cm tall ≤ 25% bare ground; less than 25% of veg. > 30cm tall Little or no bare ground; more than 25% of veg. > 30cm tall Dense shrubs, woods, or other unsearchable habitats

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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	

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Project Name: Prohersk Islandup Project #: 21210 Turbine #: 505



TIGIEILITT	> 00% have ground; upgotation < 15 am tall
Class 1	2 90% bare ground, vegetation s risch 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

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Dense shrubs, woods, or other unsearchable habitats

Class 4

Not Searchable

Little or no bare ground; more than 25% of veg. > 30cm tall



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	

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

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menolity Class Map Project Name: 19mberst IslandUP Project #: 2121C Turbine #: 507 Date (DD/MM/YY): 26/11/20 Photo Numbers (from turbine base) Photo Numbers (from turbine base) Date (DD/MM/YY):28/10 120 Facing North: 1018 261117 Facing North: Facing East: 281018 Facing East: 261118 Observer: UMB Observer: Facing South: 261119 2810 19 Facing South: 281020 Facing West: 26(120 Facing West: Monthly/Seasonal (sketch habitat and visibility classes) N (sketch habitat and visibility classes) Monthly/Seasonal N Linear Transect Width: m Linear Transect Width: 50m 40m 30m 20m 50m 40m 30m 20m 10m 10m conarde rover deret General Habitat Description: General Habitat Description: VISIBILITY CLASSES ≥ 90% bare ground; vegetation ≤ 15cm tall Class 1 ≥ 25% bare ground; vegetation ≤ 15cm tall Class 2 ≤ 25% bare ground; less than 25% of veg. > 30cm tall Class 3 Little or no bare ground; more than 25% of veg. > 30cm tall

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Dense shrubs, woods, or other unsearchable habitats

Class 4

Not Searchable

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

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≥ 90% bare ground; vegetation ≤ 15cm tall
≥ 25% bare ground; vegetation ≤ 15cm tall
≤ 25% bare ground; less than 25% of veg. > 30cm tall
Little or no bare ground; more than 25% of yeg, > 30cm tall
Dense shrubs, woods, or other unsearchable habitats

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Visibility Clas Jap



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	

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VISIBILITY CLASSES	> 00% here around: vegetation < 15cm tall
Class 1	2 90% bare ground, vegetation 2 45 mm tol
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tail
Class 2	< 25% bare ground: less than 25% of veg. > 30cm tall
Class 3	3 20 / bare ground: more than 25% of yea, > 30cm tall
Class 4	Little or no bare ground, more than 20 schools habitate
Mat Coorchable	Dense shrubs, woods, or other unsearchable habitats
Not Searchable	

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Oleve 4	$> 00\%$ bare ground: vegetation ≤ 15 cm tall	
Class 1	2. 30 % bare ground, vegetation < 15cm tall	
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tail	
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	

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VISIBILITY CLASSES		
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall	
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall	
Class 2	< 25% bare ground; less than 25% of veg. > 30cm tall	_
Class 5	Little or no bare ground: more than 25% of veg. > 30cm tall	
Class 4	Dense abrubs woods or other unsearchable habitats	
Not Searchable	Dense shirubs, woods, or other differences the	

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Project Name: Project Name: Project #: 2121C Turbine #: 521



VISIBILITY CLASSES	to the state of the state
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tail
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 2	< 25% hare ground; less than 25% of veg. > 30cm tall
Class 3	1 20% as as here ground: more than 25% of yeg. > 30cm tall
Class 4	Little of no bale ground, more than unsearchable habitats
Not Searchable	Dense shrubs, woods, of other unsearchable research







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	

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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	

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VISIBILITY CLASSES	
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tail
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall
Class 2	≤ 25% bare ground; less than 25% of veg. > 30cm tall
Class 5	Little or no bare ground; more than 25% of veg. > 30cm tall
Class 4	Dense shrubs woods or other unsearchable habitats
Not Searchable	Dense annubs, weddy er ense

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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	

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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

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VISIBILITY CLASSES	3	-
Class 1	≥ 90% bare ground; vegetation ≤ 15cm tall	
Class 2	≥ 25% bare ground; vegetation ≤ 15cm tall	1
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	_

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Visibility Class Map Project Name: <u>Amperst Island WP</u> Project #: <u>212C</u> Turbine #: <u>526</u> Degree of Slope _____ degrees Slope Orientation _____ (e.g. SSW) Photo Numbers (from turbine base) Facing North: Date (DD/MM/YY): 18 1 06 120 Photo Numbers (from turbine base) Facing North: 280729 180601 Date (DD/MM/YY): 28107120 Facing East: 180602 Facing South: Facing East: Observer: JYB 280730 Facing West: Observer: 1800 04 Facing South: 280731 (sketch habitat and visibility classes) Facing West: 280732 Monthly/Seasonal (sketch habitat and visibility classes) N Monthly/Seasonal Linear Transect Width: Ν Linear Transect Width: 155-25-04-62 (oise) zam 50,m 40m 10m 50m 40m 30m 20m 10m General Habitat Description: General Habitat Description: ILLI GALLOS anstre w nednermuss hodge VISIBILITY CLASSES ≥ 90% bare ground; vegetation ≤ 15cm tall Class 1 ≥ 25% bare ground; vegetation ≤ 15cm tall Class 2 ≤ 25% bare ground; less than 25% of veg. > 30cm tall Class 3 Little or no bare ground; more than 25% of veg. > 30cm tall Class 4

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Not Searchable

Dense shrubs, woods, or other unsearchable habitats

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50m

40m

30m

20m

10m

VC2



ave

Eororell

gross weeds

ave

and the second s				
**********	pos	General Habitat Description: <u>Hure</u> w he doe values.		General Habitat Description:
	VISIBILITY CLASSES	<u>, </u>		
	Class 1	≥ 90% bare ground; vegetation :	i 15cm tall	
	Class 2	≥ 25% bare ground; vegetation :	15cm tall	
	Class 3	≤ 25% bare ground; less than 25	i% of veg. > 30cm tall	
	Class 4	Little or no bare ground; more th	an 25% of veg. > 30cm tall	
	Not Searchable	Dense shrubs, woods, or other u	insearchable habitats	L L
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50m

40m

30m

20m

10m



visibility class Map







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	

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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	

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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	

Project Name: Apple 151000 (UP Project #: 2121C Turbine #: 528



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	

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sibility clast Map



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	1
Class 4	Little or no bare ground; more than 25% of veg. > 30cm tall	
Not Searchable	Dense shrubs, woods, or other unsearchable habitats	

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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	

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Close 1	> 90% bare ground: vegetation ≤ 15cm tall
Class 1	$> 25\%$ bare ground; vegetation ≤ 15 cm tall
Class 2	< 25% bare ground; less than 25% of yeg. > 30cm tall
Class 3	Little or no bare ground; more than 25% of year > 30cm tall
Class 4	Little of no bale ground, more than 2010 of Veg etern tak
Not Searchable	Dense shrubs, woods, or other unsearchable habitats

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Project Name: Amberst Island WP Project #: 2121C Turbine #:36



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 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	
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