Bat Acoustic Monitoring Report

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Bat Acoustic Monitoring Report for the Proposed Ball Hill Windpark Chautauqua County, New York

February 2013

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List of Abbreviations and Acronyms

AGL	above ground level
AnaBat	AnaBat SD1
Ball Hill	Ball Hill Windpark, LLC
bp/dn	bat passes per detector night
CF	compact flash
E & E	Ecology and Environment, Inc.
kHz	kilohertz
met	meteorological
MW	megawatt
NWCC	National Wind Coordinating Collaborative
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
O&M	operations and maintenance
Project	Ball Hill Windpark
SWT	Siemens Wind Turbine
WNS	White Nose Syndrome

Executive Summary

To document the baseline bat activity at the proposed Ball Hill Windpark (Project) in Chautauqua County, New York, acoustic bat surveys were conducted by Ecology and Environment, Inc. (E & E). Acoustic monitoring was conducted to document the temporal (both nightly and seasonal) and spatial distribution of bat species group activity and diversity (as categorized by species grouped into low-frequency, mid-frequency, or *Myotis* species groups) in the Project Area.

In April 2012, two AnaBat SD1 (AnaBat) bat detectors were installed on a meteorological (met) tower within the Project Area at approximately 5 and 40 meters above ground level (AGL), hereon referred to as the Low and High detectors respectively. The detectors were deployed to record bat activity from April 12 through October 25, 2012. The acoustic bat monitoring was conducted based on recommendations received during a May 2011 meeting with the New York State Department of Environmental Conservation (NYSDEC) and follows their *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects* (January 2009).

A total of 4,530 bat passes were recorded during the survey period, and 2,243 of these passes were identified to a species group. The Low detector recorded more than double the total bat passes than the High detector. Mean bat activity per detector night for the entire sampling period across all detectors was 11.7 bat passes per detector night (bp/dn) (High = 6.9 bp/dn; Low = 16.7 bp/dn). Bat activity was highest in July. Activity was variable throughout the night, but was generally highest between 9 p.m. and 11 p.m. Low-frequency bats were the dominant species group recorded and represented 59.6% of the identifiable bat passes. *Myotis* bats comprised 20.9% of the total identifiable bat passes, but only 2.7% of the identifiable calls from the High detector.

Data from this survey found bat activity levels observed at the Project Area in 2012 were higher than those observed during 2007 surveys in the Project Area and amongst the higher totals reported from other projects in western New York State. Species composition of the bat activity recorded in the spring of 2012 indicates that the species assemblage has shifted from being dominated by *Myotis* species in the spring of 2007 (Stantec 2008a) to being dominated by low-frequency bats in 2012, while both surveys found that the low-frequency bats were the dominant species in the fall surveys (Stantec 2008b). The low-frequency bat group possibly includes big brown bats, silver-haired bats, and hoary bats.

1 Introduction

1.1 Project Background

Ball Hill Windpark, LLC (Ball Hill) is proposing to construct and operate the Ball Hill Windpark (Project) in the Chautauqua County towns of Villenova and Hanover, located in western New York State (NYS) (see Figure 1-1). The Project will include installation and operation of 42 wind turbines within an approximately 13,659-acre Project Area (35 turbines in the town of Villenova and seven in the town of Hanover) with a capacity of 96.6 megawatts (MW).

The Project will include turbine sites, access roads and an electrical collection system, a transmission line and related access road, a switchyard and substation, equipment laydown areas, and an operations and maintenance (O&M) building site. Ball Hill proposes to install the Siemens Wind Turbine (SWT) 2.3-108 model cylindrical and/or tapered tubular tower wind turbine generator. The turbine is three-bladed, upwind, horizontal axis wind turbine with a rotor diameter of 354 feet (108 meters). For 11 out of the 35 turbines sited in the town of Villenova, the blades of the wind turbines will be 85 feet (26 meters) from the ground. The remainder of the turbines, seven in the town of Hanover and 24 in the town of Villenova, the blades of the wind turbines will be144 feet (44 meters) from the ground. The nacelle is located at the top of each tower and contains the electrical generating equipment. The turbine rotor and nacelle are mounted on top of a tubular tower. Separate tower heights were selected in the towns because of land use and height and air navigation restrictions in certain areas. Each turbine will be installed on an approximate 18-foot diameter, slightly exposed concrete foundation. Each turbine included within the Project will have a nominal output of 2.3 MW. Ball Hill requested that Ecology and Environment, Inc. (E & E) conduct preconstruction bat acoustic monitoring for the proposed Project. The results of the monitoring are described in this report.

1.2 Wind Energy and Bat Issues

Construction and operation of wind energy facilities have the potential to result in adverse impacts by causing injury or death to bats through collisions with turbines and by causing habitat loss, degradation, or displacement (National Research Council 2007). In 2010, the National Wind Coordinating Collaborative (NWCC), a consortium of agricultural businesses, consumer groups, economic development organizations, utilities, environmental organizations, federal and state government and regulatory agencies, tribal governments, as well as the wind industry, issued an updated fact sheet, “Wind Turbine Interactions with Birds, Bats, and their Habitats: A Summary of Research Results and Priority Questions” (NWCC 2010). The following passage from the fact sheet is part of an overview on the status of bat issues at wind energy facilities that aptly describes the current understanding of the issues:

> Wind energy’s ability to generate electricity without many of the environmental impacts associated with other energy sources (e.g., air pollution, water pollution, mercury emissions, climate change) could benefit birds, bats, and many other plant and animal species. However, possible impacts of wind facilities on birds, bats, and their habitats have been documented and continue to be an issue. Populations of many bird and bat species are experiencing long-term declines, due in part to habitat loss and fragmentation, invasive species, and numerous anthropogenic impacts, increasing the concern over the potential effects of energy development.

Bat fatalities at wind facilities received little attention until 2003 when 1,400 to 4,000 bats were estimated to have been killed at the Mountaineer Wind Energy Center in West Virginia (Kerns and Kerlinger 2004). Documentation indicating bat fatalities at other wind energy generating facilities is continuing to be generated, and post-construction monitoring has provided the most information on bat fatalities at wind farms. In a review of 21 studies from 19 North American wind facilities, the estimated average rate of bat fatalities were found to be 20.8 to 69.6 bats per turbine per year (14.9 to 53.3 bats per MW per year) (Arnett et al. 2008). Bat fatality rates have varied between 0.7 and 24.45 bats/turbine/study period and between 0.46 and 16.3 bats/MW/study period at New York sites where recent, rigorous post-construction mortality monitoring has been conducted (Jain et al. 2011; Stantec Consulting Services 2008c). Most of the NYS wind facilities had a mixed habitat of agriculture and forested land similar to the habitat around the Project. These fatality estimates can be biased based on differences in field methodology, study period, and the presence or absence of field bias correction trials.

In general, bat mortality at wind farms is highest along forested ridge tops in the eastern United States, but high mortality has also been documented in Canadian prairie habitat and in agricultural areas of the upper Midwest (Arnett et al. 2008). In addition, data indicate that more bat fatalities occur on low wind nights, especially after a passing storm front (Arnett et al. 2008, 2010; Baerwald et al. 2009). Fatality of migratory tree-roosting species, such as the hoary bat, eastern red bat, and silver-haired bat, has been consistently documented, with peak mortality occurring during the fall migration period (Arnett et al. 2008; Kunz et al. 2007). Additionally, there have been five reported fatalities of Indiana bats (federal and state endangered) at wind energy facilities: two at the Fowler Ridge wind energy facility in west-central Indiana, one at the North Allegheny wind facility in southwestern Pennsylvania, one at the Laurel Mountain wind power facility in northeastern West Virginia, and one at Blue Creek Wind Farm, LLC in northwest Ohio (Good et al. 2011; USFWS 2012a, 2012b, 2012c).

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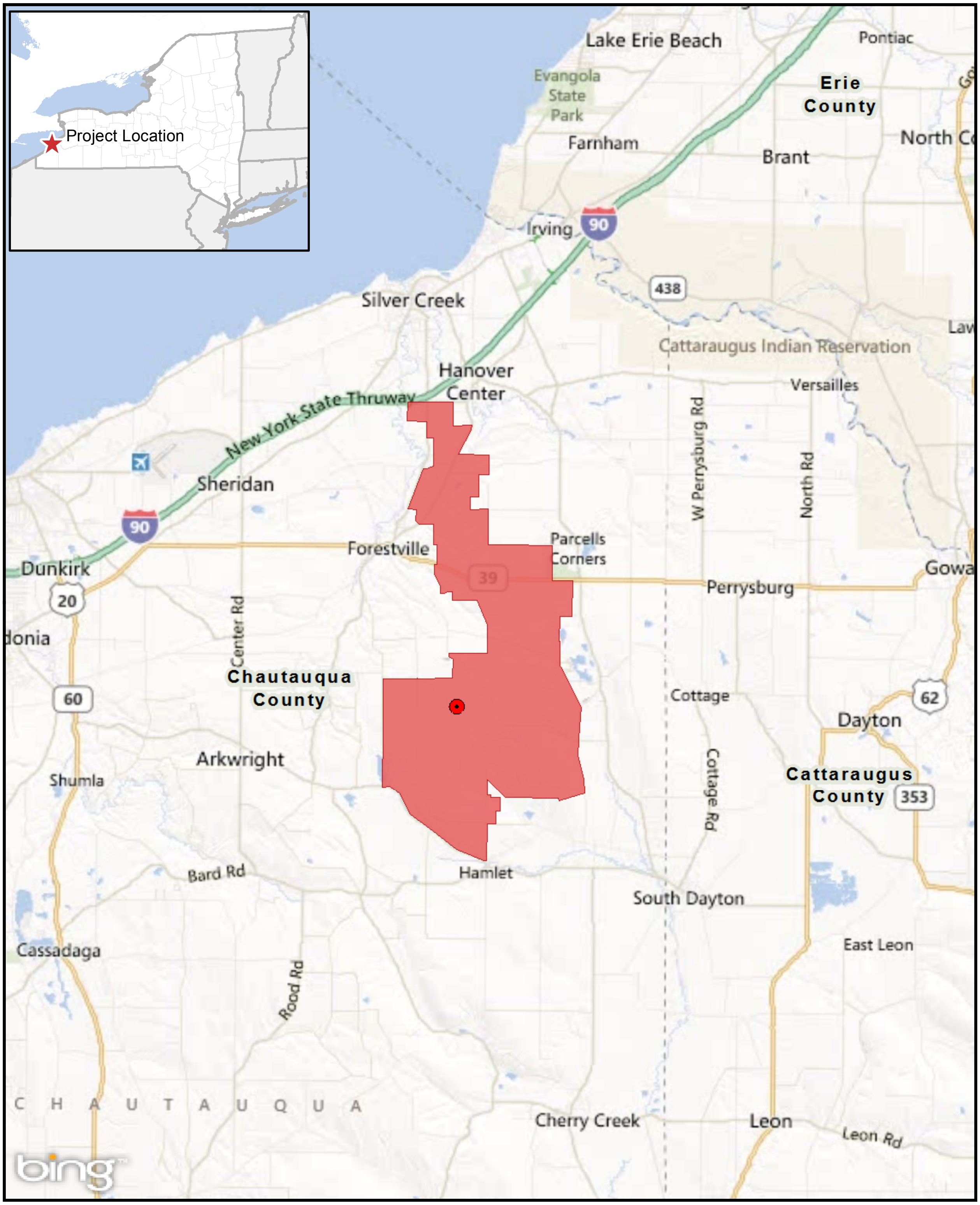

Met Tower
County Boundary
Project Area

Figure 1-1
Ball Hill Wind Farm Project Area
Ball Hill Windpark
Chautauqua County, New York
Ball Hill Windpark, LLC

0 1 2 4 Miles

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The ability to generate reliable risk assessments before constructing wind energy facilities is difficult without baseline data on bat population distribution and abundance in the Project Area; therefore, pre-construction surveys are generally warranted where bat populations and/or habitat exists. Pre-construction surveys at wind facilities have commonly been conducted, and most of the surveys employ acoustic detectors to assess the presence and activity of bat species at proposed project sites during migration (spring and fall) and summer residency. The current knowledge base does not allow using estimates of bat activity from pre-construction surveys to reliably estimate post-construction fatalities (USFWS 2012d). Therefore, the results of post construction mortality surveys within the state or region are used to help assess the potential impacts of project.

1.3 Bats of New York State

The proposed Project Area is located in an area that includes the geographic range of eight bat species, including the eastern small-footed bat (*Myotis leibii*), which is a NYS-listed species of special concern. Table 1-1 lists the nine species of bats that are known to occur in NYS. The range of the federally endangered Indiana bat does not extend into the Project Area. The closest locations for Indiana bats, according to occurrence records, are Ashtabula County, Ohio (approximately 77 miles southwest of the Project), Elk County, Pennsylvania (approximately 55 miles to the south), and it is known to occur in central New York (USFWS 2007).

Table 1-1 List of Bat Species That Occur in New York State

Common Name	Scientific Name	Roosting Habitat
Big brown bat	*Eptesicus fuscus*	Trees, structures, caves, mines
Eastern red bat	*Lasiurus borealis*	Trees
Hoary bat	*Lasiurus cinereus*	Trees
Silver-haired bat	*Lasionycteris noctivagans*	Trees
Eastern small-footed bat*	*Myotis leibii*	Trees, caves, mines, talus piles
Little brown bat	*Myotis lucifugus*	Trees, structures, caves, mines
Northern bat	*Myotis septentrionalis*	Trees, structures, caves, mines
Indiana bat**	*Myotis sodalis*	Trees, structures, caves, mines
Tri-colored bat	*Perimyotis subflavus*	Trees, structures, caves, mines, culverts

Source: Reid 2006.
*Species of special concern in New York
**Federally listed and New York State-listed endangered species

2 Project Habitat

General land use within the Project Area includes active and inactive agricultural land, forested areas, and residential areas. The population pattern in the area is low-density rural residential, consisting of scattered residences along rural roads, with the majority of the Project Area's population being located in small, widely scattered communities. Within the Project Area, active agricultural areas are used primarily for field crops and pasture with very few row crops. Inactive agricultural areas are in successional stages (progressive stages of vegetative re-growth), including successional old-field and successional shrubland communities (Edinger at al. 2002). The dominant land uses are forested (approximately 55%) and agriculture (approximately 42%).

To classify habitat types within the Project Area, percent land cover was determined from a geographic information system, field visits, and aerial photograph interpretation. The habitat types were identified and calculated (see Table 2-1 and Figure 2-1).

Table 2-1 Ecological Communities Present within the Project Area

Land use	Acres	Percent of Total
Agriculture (Hayfields, Row Crops, Pastures)	5,096	37.31%
Beech Maple Mesic	1,241	9.09%
Hemlock – Northern Hardwood	2,859	20.93%
Open Water	35	0.25%
Sucessional Northern Hardwoods	3,449	25.25%
Sucessional Old Field	430	3.15%
Successional Shrubland	298	2.18%
Tree Farm/Vineyard	251	1.84%
Total Acreage	**13,659**	**100.00%**

The mosaic of uplands and wetlands within the Project Area offers a variety of habitats and ecozones beneficial to a broad wildlife assemblage. The community structure found within the Project Area is typical of the southwest region of the state, ranging from woodlots to old fields. Wildlife associated with these communities throughout the Project Area is typical of what would be found throughout much of western NYS. Based on the variety of habitat types found throughout the Project Area, suitable habitat is present for most NYS bat species. Approximately 55% of the Project Area is forested. Although some of these stands are composed of fragmented, early successional forest, there are many large, mature stands, which would provide ample bat roosting habitat.

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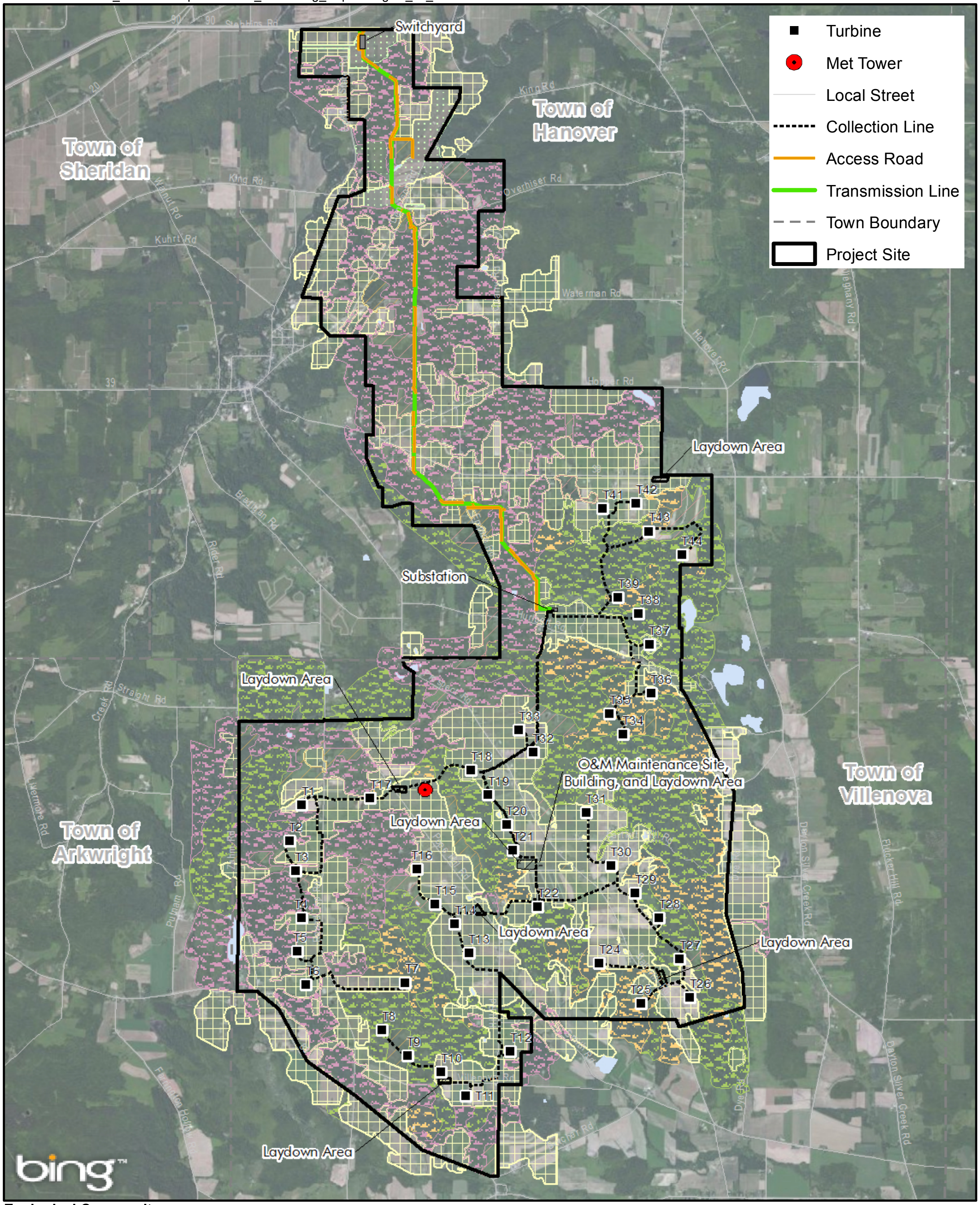

Ecological Community

- Agriculture (Hayfields, Row Crops, Pastures)
- Beech Maple Mesic
- Hemlock - Northern Hardwoods
- Open Water
- Successional Northern Hardwoods
- Successional Old Field
- Successional Shrubland
- Tree Farm/Vineyard

Figure 2-1
Ecological Communities
Ball Hill Windpark
Chautauqua County, New York
Ball Hill Windpark, LLC

0 0.25 0.5 1 Miles

3 Methods

3.1 Acoustic Monitoring

In May 2011, Ball Hill consulted with the New York State Department of Environmental Conservation (NYSDEC) following purchase of the Project. At that time, NYSDEC suggested that it would be useful to collect updated baseline information on bats from an acoustic bat study. One of NYSDEC's main reasons was that the original acoustic study was conducted in 2007 in support of the 2008 DEIS prior to the arrival of WNS in the area.

Due to concerns about the impact of wind energy development on birds and bats, NYSDEC developed pre- and post-construction survey guidelines, which are outlined in the 2009 *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects* (i.e., the protocol). The objective of these guidelines is to provide standard methodologies for wind developers to implement before and after construction in order to determine and minimize impact, on resident and migratory birds and bats.

Two detectors were deployed on a meteorological (met) tower within the Project Area to record bat activity from April 12 through October 25, 2012. The met tower where the acoustic bat monitoring was conducted is located in an active hay field in the north-central portion of the Project Area. This is the same met tower and location where the spring and fall acoustic bat surveys were originally conducted in 2007 (Stantec 2008a, 2008b). The hay field was periodically harvested throughout the survey period. There is a small wetland (approximately 0.2 acre) which is rimmed with quaking aspens (*Populus tremuloides*) in a slight depression approximately 150 feet to the northeast and there is a small (approximately 0.1 acre) emergent wetland approximately 180 feet south of the met tower. The nearest permanent water source is a small farm pond approximately 250 feet to the southeast. The closest forested area to the met tower is approximately 600 feet to the east. The location of the met tower within the Project Area is provided in Figure 3-1 and an aerial photo showing the immediate surrounding habitat is provided in Appendix A.

Acoustic monitoring was accomplished using AnaBat SD1 (AnaBat) detector units (Titley Scientific, Ballina, New South Wales, Australia) with detachable microphones at two heights on one met tower. At the outfitted met tower, two detectors were housed in a weatherproof box at the base of the tower. The microphone for one detector was mounted directly to the tower itself at approximately 5 meters above ground level (AGL) (referred to as “Low”) and the microphone for the other detector was suspended approximately 40 meters AGL (referred to as “High”).

The High microphone was deployed using a series of ropes and pulleys to suspend it from the guy-wires of the met tower. A 600-foot rope, with a single pulley in the middle, was positioned between two guy-wires that were at 90° to each other using double swing-sided pulleys. Wire rope clips were used to ensure the single pulley would remain centered between the cables at the desired height. Once the ropes were raised to the maximum height, the ends of the ropes were secured to other guy-wire supports. The microphone was then hoisted to height using the single pulley. Two additional ropes were attached to the microphone mount and tied off to assure a constant orientation of the microphone.

A telescoping painter’s pole was used to mount the Low microphone (see Appendix A). The microphone was attached to one end of the extended painter’s pole and the pole was attached to the met tower. The length of the pole was wrapped in close-cell foam to reduce vibration and interference noise between the pole and the met tower.

In all instances, the AnaBat microphones were deployed using a bat-hat (EME Systems, Berkeley, California). A bat-hat is a protective microphone housing attached to a coaxial extension cable that allows the microphone to be protected from the elements while being installed at a distance away from the AnaBat detector. Microphones were placed pointing downward towards a Lexan polycarbonate plate mounted at a 45° angle to reflect sound from above into the microphone. This placement was used to assist in surveying a greater distance of airspace up towards the theoretical rotor sweep zone, although field tests showed that this system would also detect sound from all directions. Both microphones faced to the southeast, facing away from the prevailing winds, for the duration of the survey.

The AnaBat detectors were housed in a NEMA 4 enclosure (EME Systems, Berkeley, California) and the coaxial cables connected to the microphones were inserted through the base of the enclosure. Band clamps were used to secure the enclosure to the met tower. Two AnaBat units and a 12-volt battery were placed inside the enclosure and a 10-watt solar panel and charge controller (EME Systems, Berkeley, California) was installed to maintain adequate charge to the system.

A division ratio of 16 was used for both detectors and the AnaBat detector sensitivity levels were set to detect a full calibration chirp sequence at 15 meters and a calibration tone at 20 meters using the Bat-Chirp Board (Tony Messina, Nevada Bat Technology, Las Vegas, Nevada). The Bat-Chirp Board is a microprocessor-controlled ultrasound signal generator that is used to ensure that AnaBat recording

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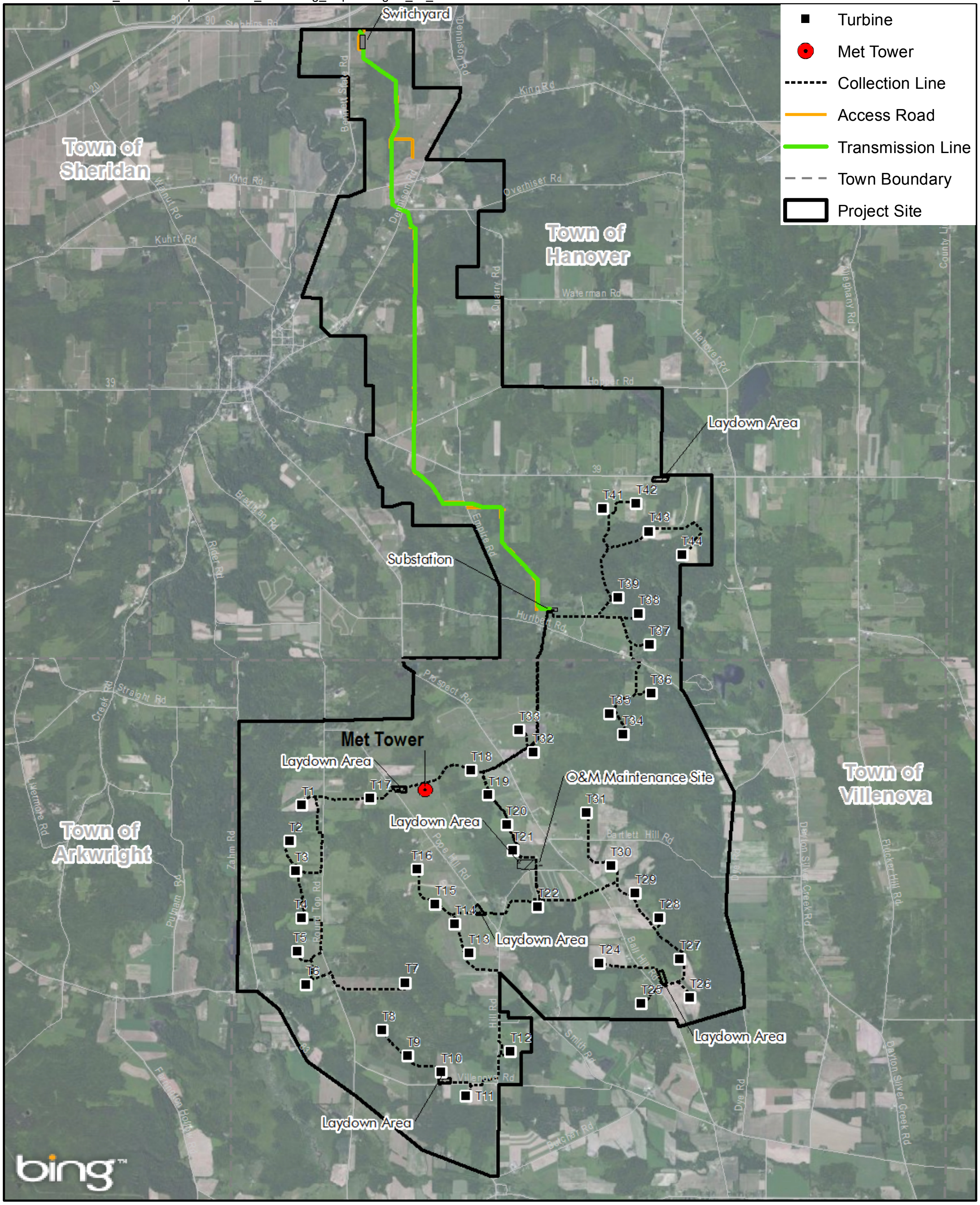

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0 0.25 0.5 1 Miles

Figure 3-1
Met Tower Location
Ball Hill Windpark
Chautauqua County, New York
Ball Hill Windpark, LLC

equipment sensitivity is properly calibrated at a given distance. The AnaBat units were set to continuously monitor the nocturnal period from at least one half hour before sunset to one half hour after sunrise the following morning. This timing was adjusted throughout the monitoring period to correlate with expanding and contracting day/night cycles. Each AnaBat unit was equipped with a 2-gigabyte compact flash (CF) card to store acoustic data. CF cards were rotated approximately every two weeks to ensure the units had adequate storage space throughout the monitoring period and also to check that the equipment was operating properly. The date, time, personnel, and CF card identification numbers were also documented during each card rotation to ensure quality control during the monitoring period. After each card rotation, the CF cards were downloaded using CFCread version 4.3.18 software (Titley Scientific, Ballina, New South Wales, Australia) and the number of files downloaded from each card was tallied.

3.2 AnaBat Data Analysis

AnaLook DOS version 4.9j and AnaLook Windows version 3.7.23 (Titley Scientific, Ballina, New South Wales, Australia) was used to manage and analyze call files. All sound files were scanned with a filter (adapted from Britzke and Murray 2000 [see Appendix B]) designed to remove files that contained noise (e.g., insects, wind, rain) so that only files that passed the filter remained. The files that passed the filter were then visually scanned to remove any additional noise files so that only bat call files remained. A bat call file is synonymous with a bat pass and is defined as any file that contains two or more echolocation pulses (Baerwald and Barclay 2009).

Each echolocation pulse has characteristics, such as slope and frequency, which can be measured quantitatively and used to identify the call sequence to a species or species group. Although it is sometimes possible to distinguish species from characteristics in the echolocation calls, factors such as intraspecific variation and variation within a bat pass make reliable identification difficult (Murray et al. 2001).

Analysis of data collected from bat detectors was completed in two phases. The first phase included identifying the total number of bat passes recorded at each detector regardless of species; this total is referred to as total bat activity. The second phase involved using call files with five or more echolocation pulses to be identified to a species group to determine the relative composition of species recorded at each detector.

3.2.1 Total Bat Activity

Total bat activity (the number of bat passes containing two or more echolocation pulses) was tabulated for each detector for each successful detector night and is reported as the number of bat passes per detector night (bp/dn). A detector night is defined as the recording session from one half hour before sunset to one half hour after sunrise the following morning. Each night the detector turned on and off at the correct times with no apparent power failures was considered a successful detector night. The mean total bat activity was calculated for each detector by averaging the values from all successful detector nights during the entire survey period. Additionally, monthly averages were calculated for each detector to further elucidate peaks in activity. These analyses were used to deduce trends in the level and timing of total bat activity. In addition, activity within the theoretical rotor swept area recorded by the High detector was compared to activity at the ground level recorded by the Low detector.

3.2.2 Species Composition

To reduce potential problems associated with misidentification, call files with at least five echolocation pulses were identified to one of three species groups (low-frequency, mid-frequency, or *Myotis* species.) using a combination of call characteristics (minimum frequency and slope) calculated in AnaLook (Baerwald and Barclay 2009).

The low-frequency species group includes bat passes with minimum frequencies typically below 30 kilohertz (kHz) and could include hoary bats, big brown bats, and silver-haired bats. The mid-frequency species includes bat passes with minimum frequencies typically between 30 and 45 kHz and minimum slope values less than 40 octaves per second. The mid-frequency group could possibly include eastern red bats and tri-colored bats. Bats in the *Myotis* genus typically produce echolocation calls with minimum frequencies of 38 to 50 kHz and have minimum slope values of greater than 40 octaves per second. Bat passes identified to the *Myotis* species group could possibly include eastern small-footed bats, Indiana bats, little brown bats, and northern bats.

The number of identifiable bat passes (five or more echolocation pulses) was tabulated for each detector to document species group composition. Total bat activity and species composition findings were also compared with other similar bat acoustic studies.

4 Results

4.1 Acoustic Monitoring

Acoustic bat monitoring was conducted from April 12, 2012, through the night of October 24, 2012, which represents 196 survey nights. There were 196 and 190 successful detector nights at the High and Low detectors, respectively, resulting in 386 total successful detector nights (see Appendix C, Table C-1). The Low detector failed to record data for six nights (August 28, October 5 through 9) due to a technician error and internal battery failure, respectively. The High detector was operational during the entire survey; however, 15 nights of operation had technical issues which may have prevented the unit from recording bat calls for a portion of the night (see Appendix C). Because the detectors still recorded call files, the data collected on those nights were included in the analysis.

There were four nights (May 25, 2012 through May 28, 2012) when both detectors missed 1 to 5 minutes at either the very beginning or end of the attempted survey period; however, the relatively small amount of the survey period missed likely does not have any significant effect on the results. Therefore, the data collected on those nights were included in the analysis.

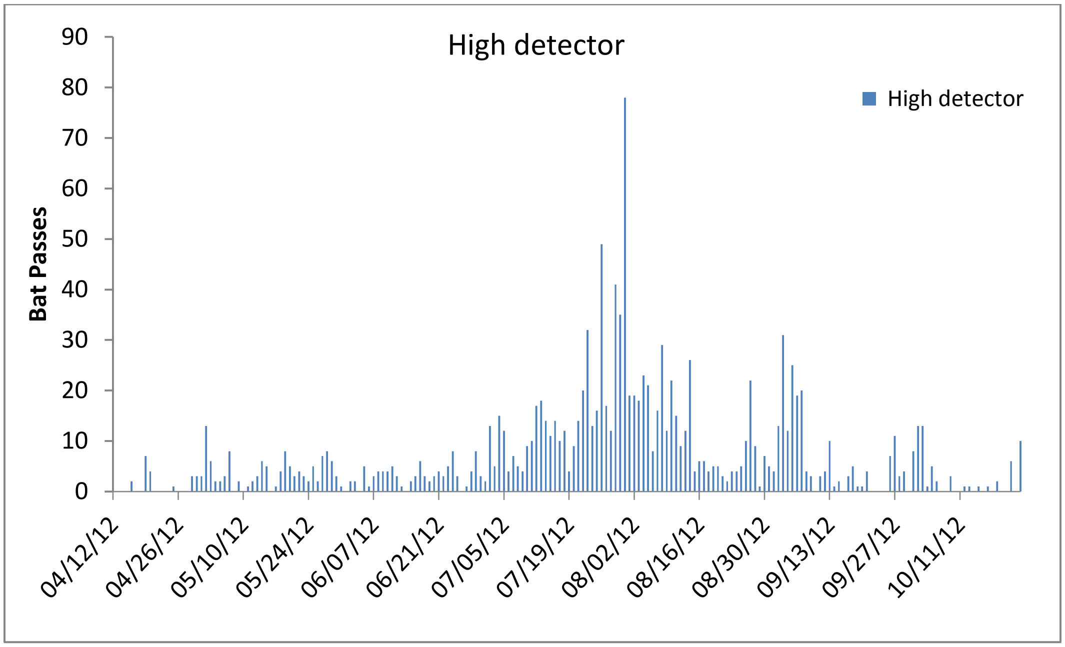
4.1.1 Total Bat Activity

A combined total of 135,790 AnaBat files were recorded from both detectors and after filtering and visual examination to eliminate extraneous noise, there were a total of 4,530 bat passes recorded. The first bat passes were recorded on April 15, 2012 and April 16, 2012, at the Low detector and High detector, respectively. Both detectors recorded bat passes during the final survey night of October 24, 2012. Mean bat activity for both detectors combined was 11.7 bp/dn (see Appendix C, Table C-3).

Total bat activity was much lower at the High detector than at the Low detector. Overall, 1,360 bat passes (30.0% of all bat passes) were detected at the High detector, while 3,170 (70.0% of all bat passes) were recorded at the Low detector (see Appendix C, Table C-2). Nightly bat activity ranged from 0 to 78 bp/dn at the High detector (see Figure 4-1) and 0 to 93 bp/dn at the Low detector (see Figure 4-2). The average number of bat passes for the entire sampling period was 6.9 for the High detector and 16.7 bp/dn for the Low detector.

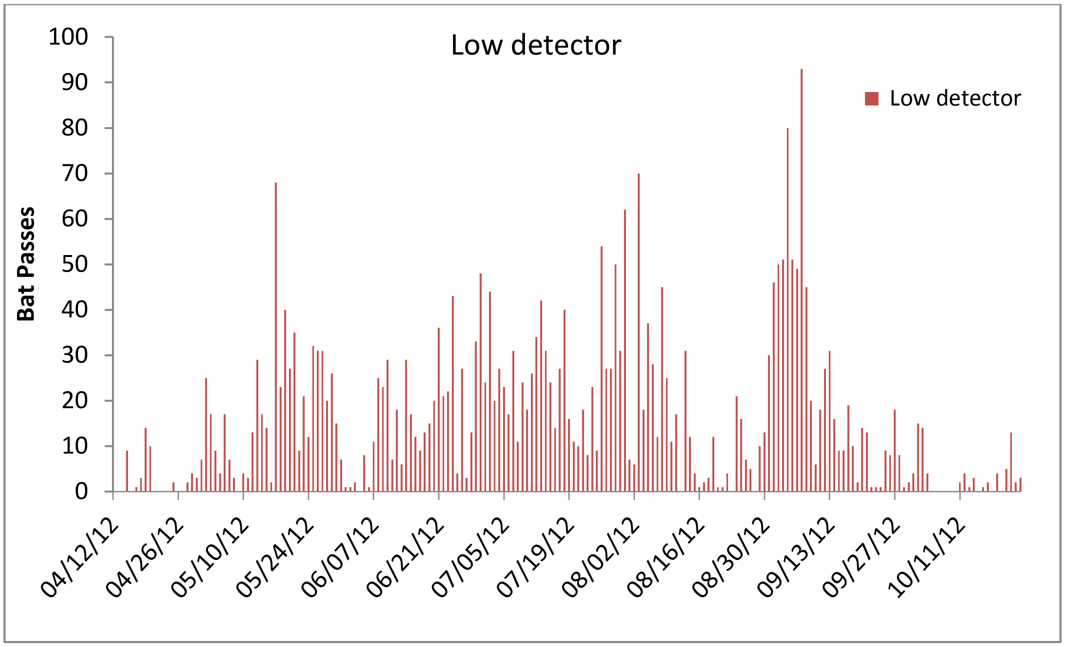
Average nightly activity calculated for each month at both detectors was variable and the trend can be described as increasing from April (1.8 bp/dn) to May (11.1

bp/dn), decreasing in June (9.8 bp/dn), peaking in July (21.7 bp/dn), decreasing in August (13.1 bp/dn), increasing slightly in September (15.2 bp/dn), and dropping off in October (3.3 bp/dn). (see Appendix C, Table C-3).



Note: Values are the total number of bat passes for all species recorded each night.

Figure 4-1 2012 Nightly Bat Activity for the High Detector



Note: Values are the total number of bat passes for all species recorded each night.

Figure 4-2 2012 Nightly Bat Activity for the Low Detector

Four distinct spikes in total bat activity were observed over the course of the study period. The first spike in activity was observed in mid-May and was primarily at the Low detector. The second, but less pronounced, spike occurred in early June after a slight lull in activity and again was mostly at the Low detector. Activity then remained relatively constant throughout the summer months. The third spike in activity occurred at the end of July to early August and was observed at both detectors. This time frame contained the most active time for the High detector. Finally, the fourth and final spike occurred at the very end of August and into the first part of September and was also observed at both detectors. This was the most active timeframe for the Low detector.

The top five highest pass rates for the High detector all occurred between July 23 and 31, 2012. The specific dates were July 31 (n=78), 26 (n=49), 29 (n=41), 30 (n=35), and 23 (n=32) respectively. The five highest pass rates for the Low detector were more spread out throughout the year. The specific dates were September 07 (n=93), September 04 (n=80), August 03 (n=70), May 17 (n=68), and July 31 (n=62), the only overlapping date.

4.1.2 Species Composition

Of the 4,530 bat passes recorded, a total of 2,243 (49.5%) were of sufficient quality to be identified to low-frequency, mid-frequency, or *Myotis* species groups. Low-frequency bats were the most prevalent (1,337 bat passes) and comprised 59.6% of the identifiable bat passes. *Myotis* species (469 bat passes, 20.9%) and mid-frequency bats (437 bat passes, 19.5%) were less common than the low-frequency bats.

All three species groups, low-frequency, mid-frequency, and *Myotis* species bats, were more prevalent at the Low detector compared to the High detector. The average activity of low-frequency bats at the Low detector was 5.1 bp/dn compared to 1.8 bp/dn at the High detector, or almost triple the activity. Mid-frequency bat activity was found to be slightly higher at the Low detector compared with the High detector and *Myotis* species activity was approximately 30 times greater at the Low detector compared with High detector totals (see Table 4-1). In terms of species composition, *Myotis,* while comprising 27.1% of recorded bats at the Low detector, only accounted for 2.7% at the High detector.

Table 4-1 Summary of 2012 Species Group Composition for Ball Hill Wind Energy Project

Species Group	Total Number of Bat Passes	Average Number of Bat Passes	Percentage of Total Bat Passes
High Detector			
Low-frequency bats	359	1.8	63.4%
Mid-frequency bats	192	1.0	33.9%
Myotis species	15	0.1	2.7%
Total High Detector	**556**	**-**	**100%**
Low Detector			
Low-frequency bats	978	5.1	58.3%
Mid-frequency bats	245	1.3	14.6%
Myotis species	454	2.4	27.1%
Total Low Detector	**1,677**	**-**	**100%**
Both Detectors			
Low-frequency bats	1,337	3.5	59.6%
Mid-frequency bats	437	1.1	19.5%
Myotis species	469	1.2	20.9%
Total Both Detectors	**2,243**	**5.8**	**100%**

4.1.3 Hourly Activity

Total Bat Activity was variable throughout the night and was highest between the 2100 hour and the 2300 hour at both detectors. Activity at the High detector peaked during the 2100 hour and declined throughout the survey night with a slight increase observed during the 0300 hour (see Figure 4-3). Activity at the Low detector showed a similar trend, but activity stayed relatively high throughout the survey night compared to activity at the High detector. These data have not been adjusted to account for daily sunset or sunrise times.

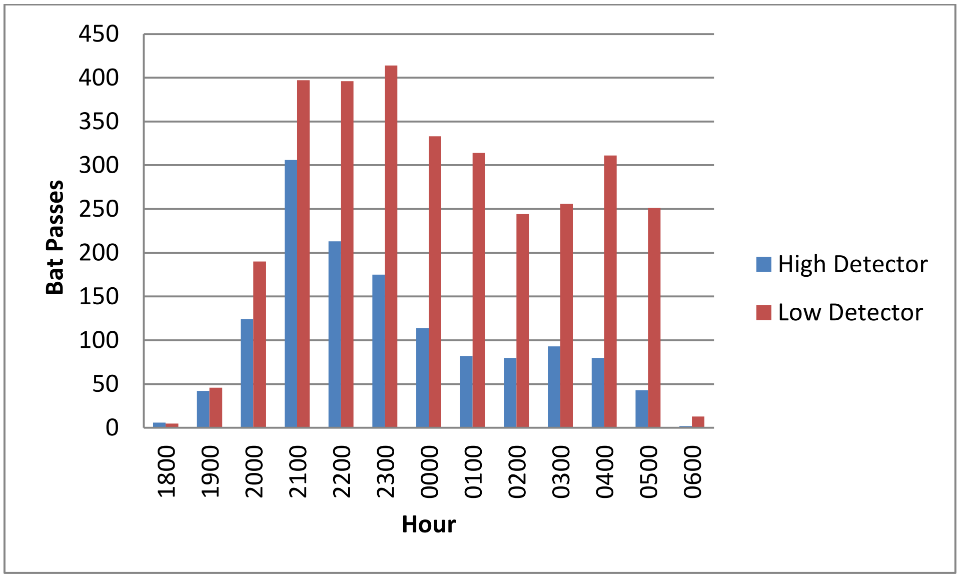


Figure 4-3 Hourly Activity

5 Discussion

The purpose of the pre-construction bat acoustic monitoring study was to collect baseline information regarding bat activity levels in the Project Area. This acoustic monitoring was conducted based on recommendations in the protocol (NYSDEC 2009). It is important to note that acoustic monitoring provides a general idea of bat activity; however, the technology cannot discriminate distinct individuals or precisely determine species composition (Kunz et al. 2007). As such, the numbers of bat passes recorded by a given detector are used to infer abundance, yet these numbers do not necessarily represent the number of bats present, as a single bat could make several passes within a night.

Studies conducted at the exact same location in the spring and fall of 2007 provide additional insight into bat activity at the Project. Stantec conducted a spring acoustic monitoring study from March 28, 2007, to May 30, 2007, and a fall study from July 30, 2007, to October 14, 2007 (Stantec Consulting Services Inc. 2008a, 2008b, see Appendix J of the 2008 DEIS for the Noble Ball Hill Windpark). In order to provide a comparison of the results from this study to the previous surveys, the data were adjusted to only reflect the timeframes where the 2007 and 2012 surveys overlap.

Compared to the previous 2007 spring acoustic survey at the site (Stantec Consulting Services 2008a), total bat activity recorded from April 17 to May 30 was much higher in 2012 (High mean = 3.1 bp/dn; Low mean = 13.6 bp/dn; total mean = 8.4 bp/dn) than in 2007 (High mean = 0.1 bp/dn; Low mean = 1.7 bp/dn; total mean = 1.1 bp/dn). Species composition in the spring of 2012 was dominated by low-frequency bats (76.2%), followed by *Myotis* (20.1%) and Mid (3.7%) bats respectively, whereas *Myotis* (60.5%) bats were the dominant species group recorded in the spring of 2007 followed by low (39.5%) bats. There were no Mid-frequency bats recorded in the spring of 2007.

Compared to the previous 2007 fall acoustic survey at the site (Stantec 2008b), total bat activity recorded from July 30 to October 14 (the timeframe of the Stantec Survey) was much higher in 2012 (High mean = 9.1 bp/dn; Low mean = 18.3 bp/dn; total mean = 13.5 bp/dn) than in 2007 (High mean = 3.2 bp/dn; Low mean = 3.8 bp/dn; total mean = 3.5 bp/dn). Species composition in both surveys was dominated by low-frequency bats (78.8% in 2007 vs. 43.0% in 2012), followed by mid-frequency bats (10.8% in 2007 vs. 32.3% in 2012) and *Myotis* (10.4% in

2007 vs. 24.7% in 2012) bats, respectively. This species composition order was similar, while it is shifted more to low-frequency bats in 2007 than in 2012.

It is important to point out that the methodology used in the 2007 and 2012 studies were not consistent. Perhaps the most important difference is the height of the detectors. In both studies, the High detector was approximately 40 meters AGL; however, in the 2007 study, the Low detector was approximately 20 meters AGL while during the 2012 study the Low detector was 5 meters AGL. Other inconsistencies in the results may be due to differences in calibration methods of the detectors. Detectors were calibrated to detect a standardized tone from the bat chirp circuit board at 10 meters (Stantec 2008a, b) while this survey used detectors calibrated to detect a signal at 20 meters. The setting on the initial filtering criteria for species groups was also slightly different between two studies. These differences likely contributed to the increased number of bat passes in the 2012 study compared to the 2007 study. Besides these technical differences, the onset of WNS that occurred shortly after the initial 2007 survey, which has decimated cave bats in NYS, could have impacted both total activity and species composition of this survey.

The mean activity levels recorded in 2012 for the Project (approximately 11.7 bp/dn) are on the upper end of the activity levels reported during other acoustic studies in the state (Reynolds 2009 [6.5 bp/dn]; Reynolds 2010a [1.1 bp/dn]; Reynolds 2010b [2.1 bp/dn]; Reynolds 2010c [1.5 bp/dn]; Stantec Consulting Services 2010 [8.4 bp/dn]; Kerns et al. 2008 [10.6 bp/dn]). There is inherent variability in bat activity due to the differences in site characteristics (i.e., habitat around the recording location) and methodology (e.g., detector sensitivity, microphone weatherproofing, survey period); therefore, making direct comparisons to other sites is difficult.

The highest levels of total bat activity in the Project area were recorded in July and September. Of the four distinct spikes in total bat activity, the first spike, in mid-May, was primarily observed at the Low detector. This occurrence likely indicates the timing of the beginning of spring migration. The second, but less pronounced spike occurred in early June and again was most pronounced at the Low detector. This spike in activity may coincide with the arrival of the summer resident population as activity remained relatively constant throughout the summer from this point on. The third spike in activity occurred at the end of July to early August and was also observed at both detectors. This spike may coincide with the first southern bound migration movements of the year as activity quickly tapered off after this spike. It was during this spike that the five highest passage rates at the Low detector occurred while only two of the five highest passage rates at the High detector occurred during this spike. Finally, the fourth and final spike occurred at the very end of August and into the first part of September and was also observed at both detectors. This spike may coincide with the bulk of southern bound migration movements of the year as activity quickly returned to minimal levels after this spike.

Low-frequency bats were the dominant species group recorded at both the High and Low detectors. The predominance of low-frequency bat species group detections, especially at the High detector (which was situated to record bats within the theoretical rotor swept area), implies that individuals comprising the likely species from that group (e.g., hoary bats, big brown bats, and silver-haired bats)—and not those from the mid-frequency or *Myotis* species groups—would be most susceptible to impacts from the Project.

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A Site Photographs

Photo A-1: Low microphone attached to the met tower.

Photo A-2: Location of the High microphone in relation to the 60-meter met tower.

Photo A-3: The High microphone suspended in the cables of the met tower.

Photo A-4: Facing northeast from the met tower towards the small patch of quaking aspen.

Photo A-5: Facing southeast from the met tower towards the farm pond.

Photo A-6: Facing south from the met tower towards the nearby emergent wetland.

Document Path: L:\Buffalo\Ball_Hill\2011\Maps\MXD\BaldEagleReport\March22_2012\Met Tower Location.mxd

Source: NYSGIS Clearinghouse, 2008.

Photo A-7: Aerial photo of the met tower and surrounding habitat (red arrow indicates direction of microphones).

B AnaBat Filter Parameters

Table B-1 Analook Filter Parameters[1]

Parameter	Value
Smooth	15
Bodyover[2]	80
MinDur	1
MinFMin	14
MinNCalls[3]	2

[1] Adapted from Britzke and Murray 2000.
[2] Parameter value is changed to 240 to sort out call files that are identifiable to a species group
[3] Parameter value is changed to 5 to sort out call files with a minimum of 5 pulses

C

AnaBat Detector Results Tables and High Detector Technical Issue Explanation

C AnaBat Detector Results Tables and High Detector Technical Issue Explanation

Table C-1 Survey Effort

Month	Detector Nights Attempted	Successful Detector Nights		
		High	Low	Total
April	19	19	19	38
May	31	31	31	62
June	30	30	30	60
July	31	31	31	62
August	31	31	30	61
September	30	30	30	60
October	24	24	19	43
Total	**196**	**196**	**190**	**386**
Percent of Successful Detector Nights		**100%**	**96.9%**	**98.5%**

Explanation of High Detector Technical Issues

After reviewing the High unit's recording history file, as well as the call file dataset, it was determined that the unit experienced some instances when significant amounts of background noise would cause it to either reboot itself, called an "overflow restart," or it would record an unexpected audio wave file. Through personal communications with Chris Corbin, the inventor of AnaBat, the exact reason the units react this way has not been determined.

The internal rebooting takes less than a second. Nineteen (19) different sample nights have a number of overflow restarts ranging from 1 to 241. Even if it was assumed that bat files could not be recorded during the time, which is contrary to what was found, the worst night would have only resulted in a 3-minute data gap, which would be negligible. Therefore, these sample nights were not removed from the dataset.

The recording of wave files occurred on 15 sample nights. Analysis of the raw data showed no AnaBat files were produced during these periods that ranged from just two seconds to five hours and 37 minutes (see Table C-2). Of the 15 affected nights, eight were a trivial amount of time of only a few seconds to minutes. During seven of the affected nights, there was a more significant data gap present ranging from 1 hour and 16 minutes to 5 hours and 37 minutes, making up 11.1% to 53.6% of the survey period respectively. Bat passes were recorded on all 15 sample nights which had these issues. The night with the highest total activity (n=78) for the High detector was actually recorded on the same night as the longest data gap. Therefore, the data from all sample nights were still included in the High detector data set analysis,

Table C-2 Summary of .WAV File Anomaly

Sample Night	File Duration (h:mm:ss)	Percentage of Sample Night containing .WAV file[1]
06/24/12	0:00:02	0.01%
07/27/12	2:05:04	20.1%
07/30/12	3:40:01	35.0%
07/31/12	5:37:36	53.6%
08/02/12	5:25:56	51.4%
08/03/12	4:44:57	44.8%
08/06/12	4:35:18	42.8%
08/07/12	0:00:21	0.05%
08/13/12	0:01:30	0.23%
08/17/12	0:00:46	0.11%
08/18/12	0:06:57	1.03%
08/19/12	0:00:31	0.08%
08/20/12	0:01:57	0.29%
08/24/12	1:16:22	11.1%
09/09/12	0:01:38	0.22%

[1] A sample night is defined as one half hour before sunset to one half hour after sunrise.

Table C-3 Monthly Summary of Total Bat Activity and Species Group Activity

Detector/ Month	Total Bat Activity		Low-freq Bat Activity		Mid-freq Bat Activity		*Myotis* Spp. Activity	
	No. of Bat Passes	Mean Activity	No. of Bat Passes	Mean Activity	No. of Bat Passes	Mean Activity	No. of Bat Passes	Mean Activity
High Detector								
April	20	1.1	7	0.4	1	0.1	0	0.0
May	118	3.8	52	1.7	2	0.1	5	0.2
June	92	3.1	35	1.2	6	0.2	2	0.1
July	522	16.8	126	4.1	79	2.5	4	0.1
August	351	11.3	58	1.9	75	2.4	2	0.1
September	190	6.3	64	2.1	14	0.5	2	0.1
October	67	2.8	17	0.7	15	0.6	0	0.0
Total	**1,360**	**6.9**	**359**	**1.8**	**192**	**1.0**	**15**	**0.1**
Low Detector								
April	48	2.5	23	1.2	1	0.1	14	0.7
May	568	18.3	332	10.7	17	0.5	82	2.6
June	497	16.6	233	7.8	31	1.0	70	2.3
July	823	26.5	392	12.6	156	5.0	100	3.2
August	449	15.0	127	4.1	127	4.1	80	2.6
September	706	24.3	197	6.8	82	2.8	120	4.1
October	79	4.0	33	1.3	23	0.9	3	0.1
Total	**3,170**	**16.7**	**1,337**	**6.8**	**437**	**2.2**	**469**	**2.4**
Both Detectors								
April	68	1.8	30	0.8	2	0.1	14	0.4
May	686	11.1	384	6.2	19	0.3	87	1.4
June	589	9.8	268	4.5	37	0.6	72	1.2
July	1345	21.7	518	8.4	235	3.8	104	1.7
August	800	13.1	185	3.0	202	3.3	82	1.3
September	896	15.2	261	4.4	96	1.6	122	2.1
October	146	3.3	50	1.0	38	0.8	3	0.1
Total	**4,530**	**11.7**	**1,696**	**4.3**	**629**	**1.6**	**484**	**1.2**

Table C-4 Daily Summary of Total Bat Activity and Species Group Activity

	High Detector				Low Detector				Both Detectors
	Total Bat Activity	Species Group Bat Passes			Total Bat Activity	Species Group Bat Passes			Total Bat Activity
Date		Low	Medium	*Myotis*		Low	Medium	*Myotis*	
04/12/12	0	0	0	0	0	0	0	0	0
04/13/12	0	0	0	0	0	0	0	0	0
04/14/12	0	0	0	0	0	0	0	0	0
04/15/12	0	0	0	0	9	4	0	1	9
04/16/12	2	1	0	0	0	0	0	0	2
04/17/12	0	0	0	0	1	0	0	1	1
04/18/12	0	0	0	0	3	1	0	1	3
04/19/12	7	2	0	0	14	6	0	3	21
04/20/12	4	3	1	0	10	4	0	2	14
04/21/12	0	0	0	0	0	0	0	0	0
04/22/12	0	0	0	0	0	0	0	0	0
04/23/12	0	0	0	0	0	0	0	0	0
04/24/12	0	0	0	0	0	0	0	0	0
04/25/12	1	0	0	0	2	0	0	1	3
04/26/12	0	0	0	0	0	0	0	0	0
04/27/12	0	0	0	0	0	0	0	0	0
04/28/12	0	0	0	0	2	0	0	1	2
04/29/12	3	0	0	0	4	0	0	3	7
04/30/12	3	1	0	0	3	1	0	1	6
05/01/12	3	1	1	1	7	4	0	0	10
05/02/12	13	7	0	0	25	17	0	0	38
05/03/12	6	2	0	1	17	13	0	2	23
05/04/12	2	1	0	0	9	3	0	0	11
05/05/12	2	2	0	0	4	2	1	1	6
05/06/12	3	2	0	0	17	13	1	1	20
05/07/12	8	5	0	1	7	1	0	0	15
05/08/12	0	0	0	0	3	1	0	0	3
05/09/12	2	1	0	0	0	0	0	0	2
05/10/12	0	0	0	0	4	3	0	0	4
05/11/12	1	0	0	0	3	2	1	0	4
05/12/12	2	1	0	0	13	9	1	0	15
05/13/12	3	0	0	0	29	15	0	5	32
05/14/12	6	3	0	0	17	6	1	4	23
05/15/12	5	4	0	0	14	6	0	1	19
05/16/12	0	0	0	0	2	2	0	0	2
05/17/12	1	1	0	0	68	36	0	2	69
05/18/12	4	1	0	0	23	11	1	1	27
05/19/12	8	3	0	1	40	23	0	4	48
05/20/12	5	3	0	0	27	14	0	4	32
05/21/12	3	1	1	0	35	12	0	9	38
05/22/12	4	1	0	0	9	5	0	0	13
05/23/12	3	2	0	0	21	10	2	1	24

Table C-4 Daily Summary of Total Bat Activity and Species Group Activity

Date	High Detector				Low Detector				Both Detectors
	Total Bat Activity	Species Group Bat Passes			Total Bat Activity	Species Group Bat Passes			Total Bat Activity
		Low	Medium	*Myotis*		Low	Medium	*Myotis*	
05/24/12	2	1	0	0	12	5	1	1	14
05/25/12	5	3	0	0	32	13	2	7	37
05/26/12	2	1	0	0	31	12	2	10	33
05/27/12	7	2	0	1	31	13	0	8	38
05/28/12	8	4	0	0	20	8	0	3	28
05/29/12	6	0	0	0	26	10	1	7	32
05/30/12	3	0	0	0	15	9	0	3	18
05/31/12	1	0	0	0	7	2	1	3	8
06/01/12	0	0	0	0	1	0	0	0	1
06/02/12	2	2	0	0	1	0	0	0	3
06/03/12	2	0	0	0	2	1	0	0	4
06/04/12	0	0	0	0	0	0	0	0	0
06/05/12	5	3	0	0	8	1	0	2	13
06/06/12	1	1	0	0	1	0	0	0	2
06/07/12	3	1	0	0	11	6	0	1	14
06/08/12	4	2	0	0	25	5	2	8	29
06/09/12	4	1	0	0	23	9	1	8	27
06/10/12	4	3	0	1	29	11	4	8	33
06/11/12	5	0	0	0	7	2	0	2	12
06/12/12	3	0	1	0	18	5	1	1	21
06/13/12	1	0	0	0	6	1	0	0	7
06/14/12	0	0	0	0	29	12	2	9	29
06/15/12	2	0	1	0	17	9	0	1	19
06/16/12	3	1	1	0	12	8	1	1	15
06/17/12	6	2	1	0	9	4	2	1	15
06/18/12	3	0	0	0	13	5	3	0	16
06/19/12	2	0	0	0	15	3	2	3	17
06/20/12	3	1	0	0	20	9	0	4	23
06/21/12	4	1	0	0	36	10	0	6	40
06/22/12	3	2	0	0	21	9	2	1	24
06/23/12	5	4	0	0	22	8	0	3	27
06/24/12	8	3	0	0	43	22	0	2	51
06/25/12	3	0	2	0	4	1	1	0	7
06/26/12	0	0	0	0	27	11	0	5	27
06/27/12	1	1	0	0	3	0	0	0	4
06/28/12	4	2	0	0	13	7	0	0	17
06/29/12	8	3	0	0	33	19	0	0	41
06/30/12	3	2	0	1	48	20	4	2	51
07/01/12	2	1	0	0	24	8	2	6	26
07/02/12	13	7	0	0	44	17	2	1	57
07/03/12	5	2	0	0	20	11	2	0	25
07/04/12	15	2	2	0	27	14	4	2	42
07/05/12	12	5	1	0	23	6	4	2	35

Table C-4 Daily Summary of Total Bat Activity and Species Group Activity

Date	High Detector				Low Detector				Both Detectors
	Total Bat Activity	Species Group Bat Passes			Total Bat Activity	Species Group Bat Passes			Total Bat Activity
		Low	Medium	*Myotis*		Low	Medium	*Myotis*	
07/06/12	4	1	2	0	17	8	2	2	21
07/07/12	7	1	2	0	31	12	0	4	38
07/08/12	5	3	0	0	11	5	2	0	16
07/09/12	4	0	1	0	24	1	4	7	28
07/10/12	9	3	4	0	18	5	5	2	27
07/11/12	10	4	2	0	26	7	3	7	36
07/12/12	17	5	2	1	34	11	3	4	51
07/13/12	18	4	0	0	42	11	4	5	60
07/14/12	14	7	1	0	31	14	1	6	45
07/15/12	11	4	4	1	24	11	4	2	35
07/16/12	14	7	1	0	14	7	0	1	28
07/17/12	10	5	0	0	27	17	0	1	37
07/18/12	12	6	0	0	40	14	0	8	52
07/19/12	4	2	0	0	16	8	0	0	20
07/20/12	9	5	1	0	11	5	1	0	20
07/21/12	14	3	3	0	10	3	1	2	24
07/22/12	20	2	1	0	18	4	0	4	38
07/23/12	32	14	5	0	8	4	0	0	40
07/24/12	13	3	2	0	23	5	2	2	36
07/25/12	16	4	1	0	9	4	0	0	25
07/26/12	49	8	6	0	54	21	2	4	103
07/27/12	17	2	3	0	27	10	0	5	44
07/28/12	12	1	4	1	27	2	2	7	39
07/29/12	41	6	2	0	50	9	5	7	91
07/30/12	35	3	6	0	31	2	6	1	66
07/31/12	78	6	23	1	62	10	16	4	140
08/01/12	19	4	8	0	7	4	0	0	26
08/02/12	19	1	5	0	6	1	1	0	25
08/03/12	18	3	4	1	70	13	12	7	88
08/04/12	23	1	6	0	18	0	1	3	41
08/05/12	21	4	3	0	37	10	5	5	58
08/06/12	8	1	1	0	28	1	3	10	36
08/07/12	16	2	4	0	12	2	0	2	28
08/08/12	29	5	6	0	45	5	6	8	74
08/09/12	12	2	0	0	25	5	4	1	37
08/10/12	22	4	3	0	11	1	0	3	33
08/11/12	15	4	1	0	17	1	3	1	32
08/12/12	9	2	1	0	0	0	0	0	9
08/13/12	12	1	6	0	31	1	3	12	43
08/14/12	26	1	7	0	12	3	1	3	38
08/15/12	4	1	0	0	4	1	0	0	8
08/16/12	6	1	2	0	1	0	0	0	7
08/17/12	6	1	1	0	2	1	1	0	8

Table C-4 Daily Summary of Total Bat Activity and Species Group Activity

Date	High Detector				Low Detector				Both Detectors
	Total Bat Activity	Species Group Bat Passes			Total Bat Activity	Species Group Bat Passes			Total Bat Activity
		Low	Medium	*Myotis*		Low	Medium	*Myotis*	
08/18/12	4	0	1	0	3	0	0	2	7
08/19/12	5	1	1	0	12	1	0	1	17
08/20/12	5	1	1	0	1	0	0	1	6
08/21/12	3	1	0	0	1	0	0	0	4
08/22/12	2	1	0	0	4	1	1	0	6
08/23/12	4	0	1	0	0	0	0	0	4
08/24/12	4	1	0	0	21	2	4	3	25
08/25/12	5	1	0	0	16	5	2	2	21
08/26/12	10	2	2	0	7	1	0	1	17
08/27/12	22	10	1	0	5	2	0	0	27
08/28/12	9	2	4	1	-	-	-	-	9
08/29/12	1	0	1	0	10	2	0	5	11
08/30/12	7	0	4	0	13	1	2	3	20
08/31/12	5	0	1	0	30	5	3	5	35
09/01/12	4	1	1	0	46	16	2	2	50
09/02/12	13	2	3	0	50	14	6	4	63
09/03/12	31	10	2	0	51	13	7	5	82
09/04/12	12	4	1	0	80	9	8	26	92
09/05/12	25	11	1	0	51	8	7	6	76
09/06/12	19	8	1	0	49	10	4	12	68
09/07/12	20	11	0	0	93	18	12	18	113
09/08/12	4	0	0	1	45	7	7	15	49
09/09/12	3	0	0	1	20	3	4	5	23
09/10/12	0	0	0	0	6	2	0	2	6
09/11/12	3	0	0	0	18	2	0	1	21
09/12/12	4	1	0	0	27	2	1	1	31
09/13/12	10	2	0	0	31	4	4	1	41
09/14/12	1	0	0	0	16	4	0	2	17
09/15/12	2	0	0	0	9	0	0	3	11
09/16/12	0	0	0	0	9	1	0	1	9
09/17/12	3	2	0	0	19	2	0	3	22
09/18/12	5	0	2	0	10	1	1	2	15
09/19/12	1	0	0	0	2	0	1	0	3
09/20/12	1	0	0	0	14	4	0	4	15
09/21/12	4	2	1	0	13	1	2	1	17
09/22/12	0	0	0	0	1	0	0	0	1
09/23/12	0	0	0	0	1	0	1	0	1
09/24/12	0	0	0	0	1	0	0	0	1
09/25/12	0	0	0	0	9	0	0	1	9
09/26/12	7	2	2	0	8	2	0	1	15
09/27/12	11	7	0	0	18	10	1	1	29
09/28/12	3	0	0	0	8	0	0	1	11
09/29/12	4	1	0	0	1	0	0	0	5

Table C-4 Daily Summary of Total Bat Activity and Species Group Activity

Date	High Detector				Low Detector				Both Detectors
	Total Bat Activity	Species Group Bat Passes			Total Bat Activity	Species Group Bat Passes			Total Bat Activity
		Low	Medium	*Myotis*		Low	Medium	*Myotis*	
09/30/12	0	0	0	0	2	0	0	0	2
10/01/12	8	4	2	0	4	0	1	0	12
10/02/12	13	3	0	0	15	2	2	0	28
10/03/12	13	4	2	0	14	4	0	1	27
10/04/12	1	0	0	0	4	0	0	1	5
10/05/12	5	0	2	0	-	-	-	-	5
10/06/12	2	0	1	0	-	-	-	-	2
10/07/12	0	0	0	0	-	-	-	-	0
10/08/12	0	0	0	0	-	-	-	-	0
10/09/12	3	0	0	0	-	-	-	-	3
10/10/12	0	0	0	0	0	0	0	0	0
10/11/12	0	0	0	0	2	0	2	0	2
10/12/12	1	0	1	0	4	0	0	0	5
10/13/12	1	1	0	0	1	0	0	0	2
10/14/12	0	0	0	0	3	1	0	1	3
10/15/12	1	1	0	0	0	0	0	0	1
10/16/12	0	0	0	0	1	0	0	0	1
10/17/12	1	0	0	0	2	0	0	0	3
10/18/12	0	0	0	0	0	0	0	0	0
10/19/12	2	0	1	0	4	0	0	0	6
10/20/12	0	0	0	0	0	0	0	0	0
10/21/12	0	0	0	0	5	3	1	0	5
10/22/12	6	1	2	0	13	5	2	0	19
10/23/12	0	0	0	0	2	1	0	0	2
10/24/12	10	3	4	0	3	0	0	0	13
Total	**1,360**	**359**	**192**	**15**	**3,170**	**978**	**245**	**454**	**4,530**
Average Bat Passes per Night:	**6.9**	**1.8**	**1.0**	**0.1**	**16.7**	**5.1**	**1.3**	**2.4**	**11.7**

Bat Acoustic Survey Report

Bat Acoustic Survey Report for the Ball Hill Wind Project Towns of Villenova and Hanover Chautauqua County, New York

November 2015

Prepared for:

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List of Abbreviations and Acronyms

Ball Hill	Ball Hill Wind Energy, LLC
BCID	Bat Call Identification, Inc.
E & E	Ecology and Environment, Inc.
MLE	maximum likelihood estimator
Project	Ball Hill Wind Project
RES Americas	Renewable Energy Systems Americas, Inc.
USFWS	United States Fish and Wildlife Service
USFWS Guidelines	*2015 Range-wide Indiana Bat Summer Survey Guidelines*

Executive Summary

Ecology and Environment, Inc. (E & E) has been contracted by Renewable Energy Systems Americas, Inc. (RES Americas) to conduct bat acoustic surveys within an approximately 10,422-acre Project Area located in Chautauqua County, New York, to provide summer occurrence information for local bat species, potentially including the federally threatened northern long-eared bat (*Myotis septentrionalis*). The survey was conducted according to the Phase 2 work plan submitted to the United States Fish and Wildlife Service (USFWS) on July 23, 2015 for the Project Sponsor, Ball Hill Wind Energy, LLC (Ball Hill), a direct subsidiary of RES Americas (E & E 2015). The information collected as part of the survey effort will be included as part of due diligence and permitting efforts for the Ball Hill Wind Project.

Over a three-week period, July 29 through August 19, 2015, AnaBat (Titley Scientific) bat detectors were installed at 49 sites or 99 detector locations (two detectors per site with three detectors at one site), in suitable habitat within the Project Area and set to record for a minimum of two consecutive nights. Following data collection, a multi-analysis approach was used to assess the likelihood for the northern long-eared bat to be present within the Project Area. The approach incorporated the results from two automated classifiers, maximum likelihood estimations, and independent reviews from three E & E bat specialists with expertise in acoustic identification.

Fourteen detector nights had a significant maximum likelihood estimator (MLE) p-values for presence of northern long-eared bats. From these detector nights, 10 call files were preliminarily identified as northern long-eared bat calls by the automated classifier Bat Call Identification, Inc. (BCID) and 46 call files were preliminarily identified by Kaleidoscope Pro. Both software programs identified calls as northern long-eared bats at Site 38-B on August 12, 2015.

E & E's bat specialists reviewed the call files and identified calls as possible northern long-eared bat calls at three recording locations. The results of this bat acoustic survey determined that the northern long-eared bat presence was possible at two detector locations and probable for at least one detector location within the Project Area during the summer study period.

1 Introduction

1.1 Site Background

Ball Hill Wind Energy, LLC (Ball Hill) is planning to construct and operate the Ball Hill Wind Project (Project) within the 10,422-acre Project Area located in the towns of Villenova and Hanover, Chautauqua County New York. The Project will include minor forest clearing activities during construction and other potential operational impacts. A map of the Project Area boundary is provided as Figure 1-1.

The Project is located within the summer range of the northern long-eared bat (*Myotis septentrionalis*), a species recently listed as threatened by the United States Fish and Wildlife Service (USFWS) under the Endangered Species Act. This species is also listed as threatened in New York State.

As a voluntary act of due diligence and as a supplement to previous bat studies in the Project Area, Ball Hill requested that Ecology and Environment, Inc. (E & E) conduct a bat acoustic survey to assess the potential presence and distribution of local bat species within the Project Area. These data will aid in the development of any future construction and operation conservation measures that will protect and benefit any bat species found at the Project Area.

1.2 Bats of Western New York

The Project Area includes portions of the geographic ranges of eight bat species, including the federal and state threatened northern long-eared bat and the eastern small-footed bat (*Myotis leibii*), a species of special concern within the state of New York. Table 1-1 lists the eight species of bats that are known to occur in western New York, and could potentially occur within the Project Area.

Table 1-1 List of Potential Bat Species at the Ball Hill Wind Project Area

Common Name	Scientific Name	Status	Roosting Habitat
Big brown bat	*Eptesicus fuscus*	--	Trees, structures, caves, mines
Silver-haired bat	*Lasionycteris noctivagans*	--	Trees, structures, rock crevices
Eastern red bat	*Lasiurus borealis*	--	Trees
Hoary bat	*Lasiurus cinereus*	--	Trees
Eastern small-footed bat	*Myotis leibii*	SC	Caves, mines
Little brown bat	*Myotis lucifugus*	--	Trees, structures, caves, mines
Northern long-eared bat	*Myotis septentrionalis*	ST, FT	Trees, structures, caves, mines
Tri-colored bat	*Perimyotis subflavus*	--	Trees, structures, caves, mines, culverts

Source: Harvey et al. 2011

Key:

FT = Federally Threatened (USFWS)
ST = State Threatened (NYSDEC)
SC = State Species of Special Concern (NYSDEC)

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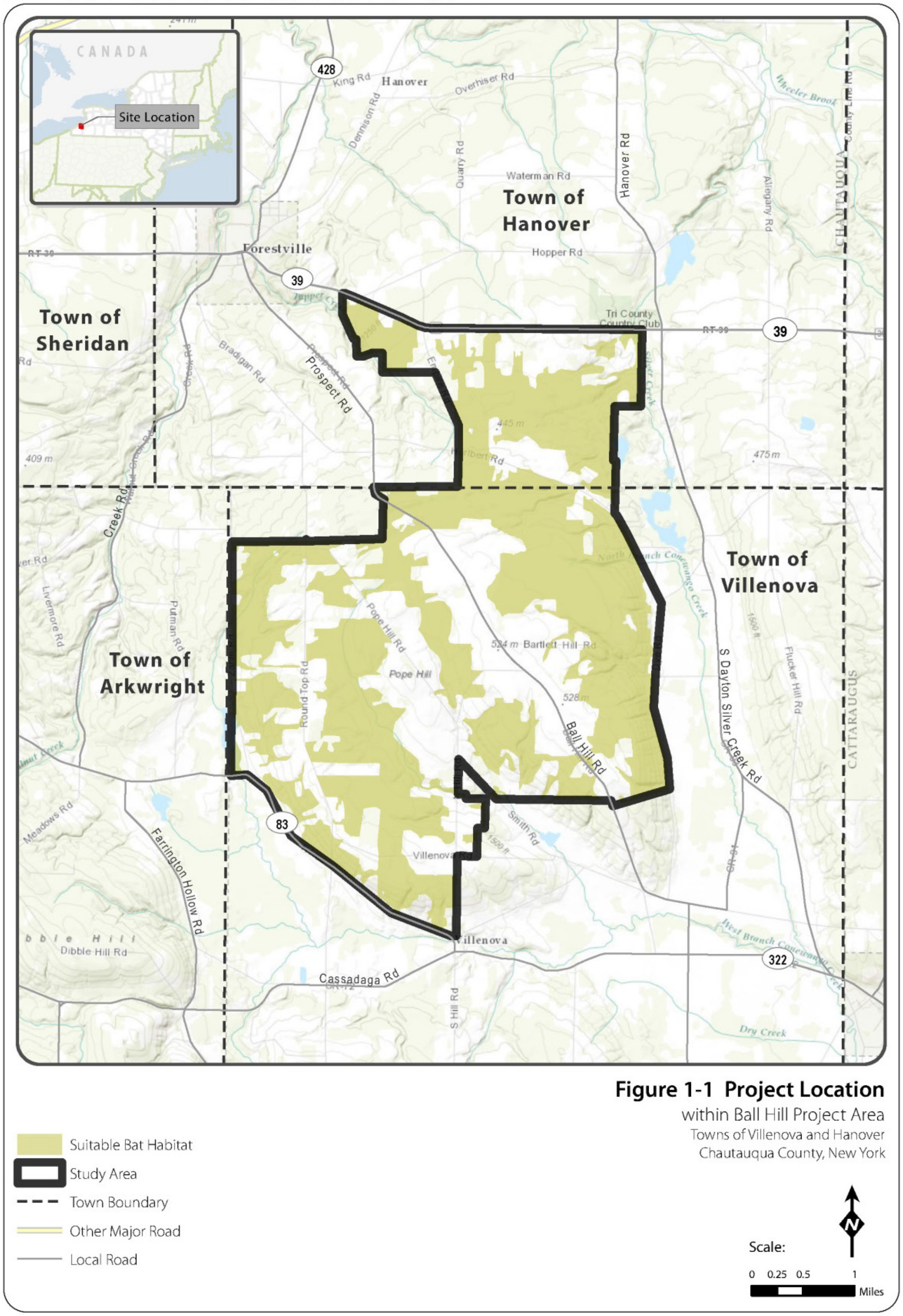

Figure 1-1 Project Location
within Ball Hill Project Area
Towns of Villenova and Hanover
Chautauqua County, New York

2 Methods

2.1 Acoustical Monitoring

E & E conducted a Phase 2 acoustic bat survey between July 29 and the morning of August 19, 2015, to assess the potential presence and distribution of local bat species, including the northern long-eared bat within the Project Area. Acoustic surveys followed the guidelines outlined in the work plan submitted to the USFWS on July 23, 2015 (E & E 2015), which was based on recommendations in the *2015 Range-Wide Indiana Bat Summer Survey Guidelines* (USFWS 2015a [USFWS Guidelines]) applicable for northern long-eared bat presence/probable absence surveys for the 2015 field season. Details of the sampling protocol are outlined below.

The survey effort was determined using the USFWS Guidelines, which require a minimum of four detector nights per 123 acres of suitable summer habitat. A detector night is defined as one detector set recording from sunset to sunrise at one location for one night. The Project Area includes a total of 5,959 acres of suitable bat habitat as determined by the Phase 1 habitat assessment and, thus, required a total of 196 detector nights. To meet this survey requirement, E & E surveyed a total of 49 sites or 99 detector locations (two per site; one site had a third detector) within the Project Area. Each detector location was surveyed for a minimum of two consecutive nights. If rain or wind conditions exceeded the recommendations in the USFWS Guidelines, data were still collected for that night, but the detectors remained on site for additional nights. An abundance of potential sites were identified via desktop and the final sites were determined based on the best habitat within accessible parcels. The distribution of detector locations across the entire Project Area allowed for robust sampling of the potential habitat within the area Ball Hill had landowner consent for survey access. A map of the final surveyed acoustic detector locations within the Project Area is provided as Figure 2-1.

Bat acoustic surveys were accomplished using AnaBat (Titley Scientific) detector units, including both SD1 and SD2 models, with directional microphones installed approximately 1.5 meters above ground level. Each detector was housed in a case allowing only the microphone to be exposed through a 45º angle PVC tube. This weatherproof case was used on each survey night because the weather forecast included the possibility of rain on many evenings. The microphone was positioned so that little to no vegetation was in front of it. Detectors were placed in suitable habitat locations within parcels with approved access throughout the Project Area that were most likely to capture high quality bat call sequences (e.g., forest openings, access roads, riparian corridors, and wooded edge habitat). Detector locations were spaced at least 200 meters (656 feet) apart and set to record from one half hour before sunset to one half hour after sunrise. All detector locations were photo-documented and coordinates were recorded with a Global Positioning System unit (see Table A-1 in Appendix A). Appendix C includes photographs of the installed detector assemblies at each detector location within the Project Area.

To the extent possible, surveys were conducted in weather conditions that satisfied the USFWS Guidelines, which include air temperatures above 10 degrees Celsius (50 degrees Fahrenheit), little to no precipitation, and light winds for the first 5 hours of the survey night. All detectors were subject to a finger rub test with the detector in record mode before and after each survey to ensure detectors were functioning properly; however, equipment issues did arise throughout the survey.

Nightly weather was reviewed for each night with publicly available data from the nearest weather station located at the Chautauqua County/Dunkirk Airport, approximately 6 miles northwest of the Project Area. After the detectors successfully recorded two nights without inclement weather, recorded acoustic data were downloaded and analyzed.

2.2 Data Analysis

All recorded bat passes were analyzed using automated species identification software approved for use by the USFWS. The software programs, or automated classifiers, included Bat Call Identification, Inc. (BCID) Eastern USA (Version 2.7c) and Kaleidoscope Pro (Version 3.1.4B, Wildlife Acoustics, Inc.). The Bats of North America (Version 3.1.0) extension was used as the classifier for Kaleidoscope, and a sensitivity setting of -1 “More Sensitive (Liberal)” was used, as required by the USFWS (USFWS 2015b). Default filter settings were used for both programs, and the species selected for possible identification were specified as big brown bat (*Eptesicus fuscus*), eastern red bat, hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), eastern small-footed bat, little brown bat (*Myotis lucifugus*), northern long-eared bat, and tri-colored bat (*Perimyotis subflavus*). Bat passes labeled as “unknown” by the automated classifiers were shorter call sequences or were inconsistent in call structures resulting in conflicting identifications.

To assess the likelihood of presence of northern long-eared bats within the Project Area, a multiple analysis approach was used that incorporated results from the automated classifiers, maximum likelihood estimations, and independent reviews from three E & E bat specialists with expertise in acoustic identification (see Appendix B). This multi-level approach was used to reduce potential problems with false-positive identifications. The visual review included a comparison of the bat call in question to a library of known northern long-eared bat calls. For

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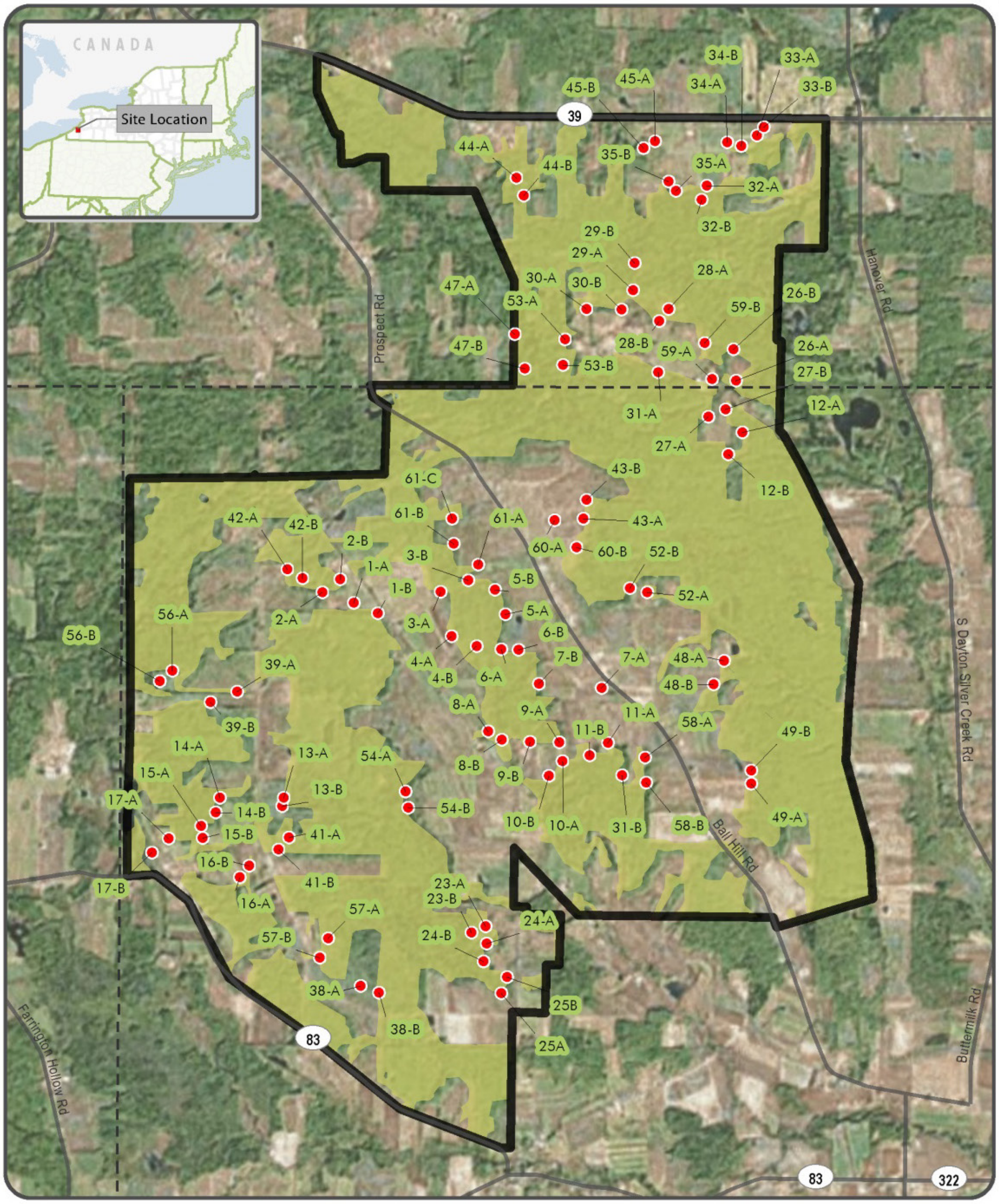

Bat Acoustic Detector Location

Suitable Bat Habitat

Study Area

Town Boundary

Local Road

Figure 2-1 Bat Acoustic Detector Locations
within Ball Hill Project Area
Towns of Villenova and Hanover
Chautauqua County, New York

N

Scale:
0 0.25 0.5 1
Miles

each detector location on each night, the total number of bat passes identified by BCID and Kaleidoscope, the p-values from the maximum likelihood estimation for presence calculated from each of the automated classifiers, and the consensus of visual confirmation from the E & E qualified bat biologists was summarized to determine the potential presence of northern long-eared bats within the Project Area. If either of the automated classifiers returned a significant p-value (<0.05) for maximum likelihood estimator (MLE) results for presence of northern long-eared bat, the panel of three E & E biologists independently reviewed all files from that detector location on that night.

For detector nights with significant MLE p-values, presence of northern long-eared bat was determined as “not likely,” “possible,” or “probable” based on a combination of factors, as follows:

- Not likely – no bat passes identified by either of the programs; or bat passes identified by only one program were identified as another species through visual confirmation.
- Possible – at least one bat pass identified by one of the programs and confirmed visually.
- Probable – bat passes identified by both programs and confirmed visually.

3 Results

3.1 Acoustical Monitoring Overview

Bat acoustical monitoring was conducted at the 99 detector locations during the three-week period of July 29 through August 19, 2015 (see Table A-1 in Appendix A). In total, 270 detector nights were attempted as part of this survey. Due to weather conditions and detector malfunction issues, 174 of these nights were considered successful nights in accordance with the USFWS Guidelines and/or had detection of a northern long-eared bat call. A successful night is defined as a night when weather conditions meet the USFWS Guidelines and/or a call is identified as a northern long-eared bat in either or both programs (see Tables A-2 and A-3 in Appendix A). Success of the detector was confirmed by examining the summary data contained in the status file generated by each detector for each survey night and confirming the presence of a finger rub file at the beginning and end of each detector dataset. Of the 94 detector nights identified as unsuccessful, 67 nights did not meet the USFWS weather guidelines and 27 nights could be attributed to detector malfunction.

There was a series of nights (August 10 through 13) when weather conditions were too rainy and windy to satisfy the USFWS Guidelines for two successful nights (see Table 3-1). E & E left 16 detectors out for the four nights and then collected the data from the detectors before the batteries died. Only one of the four nights (August 13) during this stretch had favorable survey conditions for the entire 5 hours; however, good-quality acoustic data were recorded during these nights for sites without detector malfunctions.

3.2 Species Composition

Summarized by species, the results were similar between the two automated classifiers. BCID identified 17,515 total bat passes (2% of these were identified as unknown) with the majority (87%) identified as big brown bat (49%), silver-haired bat (27%), or eastern red bat (11%). According to BCID, 10% of the files were identified as either hoary bat (5%) or tri-colored bat (5%) and the myotis species composed less than 2% of the total bat passes (see Table A-2 in Appendix A and Figure 3-1). Kaleidoscope Pro identified 31,812 total bat passes (7% of these were identified as unknown) with the majority (76%) identified as big brown bat (37%), eastern red bat (26%), silver-haired bat (13%), and hoary bat (12%). According to Kaleidoscope Pro, the remainder of the bat passes were little brown bat (3%) or tri-colored bat (1%), and 1% identified as either eastern small-footed bat or northern long-eared bat (see Table A-3 in Appendix A and Figure 3-2).

3.3 Northern Long-eared Bat Presence and Distribution

Fourteen detector nights had significant MLE p-values for presence of northern long-eared bats (see Table 3-2). For detector nights with significant MLE p-values, 10 call files were preliminarily identified as northern long-eared bat calls by the automated classifier BCID at detector locations 7-B, 10-A, 15-B, 35-B, 38-B, 47-A, and 52-B, and 46 call files were preliminarily identified as northern long-eared bat calls by the automated classifier Kaleidoscope at detector locations 11-B, 38-B, 42-A, and 58-A (see Table 3-2). Both software programs identified calls as northern long-eared bats at Site 38-B on August 12, 2015.

The panel of E & E biologists reviewed all files from detector locations where either program identified a file as northern long-eared bat with a significant p-value. A consensus on visual confirmation for northern long-eared bat was achieved at sites 38-B, 42-A, and 52-B (see Table 3-2). Based on the previously defined presence determinations, presence of northern long-eared bat is possible at sites 42-A, 52-B, and probable at site 38-B. The reasoning for overturning the identifications of northern long-eared bat calls for detector nights where there was not a consensus on visual confirmation is provided in the "Notes" column in Table 3-2.

Table 3-1 Weather Data from the Chautauqua County/Dunkirk Airport for Ball Hill Wind Project Survey Period (First 5 Hours of Each Survey Night)[1]

Night Surveyed	Sunset (24-hour)	Sunset Temperature (°F)	Minimum Temperature (°F)	Average Temperature (°F)	Wind[2] Direction	Maximum Wind Speed (mph)	Precipitation (inches)
29-Jul	2041	77	73	75.6	South southwest	8.1	None
30-Jul	2040	75.9	69.1	72	Southwest	13.8	None
31-Jul	2039	72	70	71	Southwest	12.7	None
1-Aug	2038	72	66	67.8	South southwest	9.2	None
2-Aug	2037	79	71.1	76.9	Southwest	24.2	None
3-Aug	2036	71.1	62.1	64.8	South	5.8	None
4-Aug	2034	72	64	66.2	South	9.2	0.13
5-Aug	2033	68	55	64.2	Northwest	11.5	None
6-Aug	2032	62.1	55	58.7	East	3.5	None
7-Aug	2031	66.9	62.1	63.9	East	9.2	None
8-Aug	2029	68	59	62	East northeast	8.1	None
9-Aug	2028	64	57.9	60.5	South	3.5	None
10-Aug	2027	68	68	69	Variable	6.9	0.15
11-Aug	2025	72	66.9	69.7	Northwest	12.7	None
12-Aug	2024	69.1	57	63.9	Northwest	13.8	None
13-Aug	2023	69.1	69.1	69.1	South southwest	11.5	None
14-Aug	2021	75.9	69.1	72	South southwest	8.1	None
15-Aug	2020	75	63	66.7	South	4.6	None
16-Aug	2018	75	66	69	South southwest	5.8	None
17-Aug	2017	78.1	72	73.8	Southwest	5.8	None
18-Aug	2015	73.9	70	72.2	East northeast	5.8	None

Notes:

[1] Weather data for each night begins with the hourly reading recorded at the Chautauqua County/ Dunkirk Airport which was closest to sunset time. Data were summarized for each night starting at the closest time recorded to sunset and ending 5 hours after that time.
[2] Wind direction for each 5-hour period was determined based on the most common wind direction during that period.

Key:
mph = miles per hour
in = inches

Table 3-2 Identification Matrix and Presence Determination for the Northern Long-Eared Bat

Detector Location (Date)	BCID		Kaleidoscope		Visual Confirmation Consensus	Presence	Notes
	No. of Files Identified	p-value for MLE*	No. of Files Identified	p-value for MLE*			
7-B (August 1)	1	0.02	0	n/a	No	Not Likely	Two bats present in one call file. Most likely EPFU and LABO
10-A (August 15)	1	0.02	0	n/a	No	Not Likely	LABO feeding buzz
10-A (August 16)	1	0.02	0	n/a	No	Not Likely	LABO feeding buzz
11-B (August 1)	0	n/a	1	0.03	No	Not Likely	Frequency is too low (30 kHz). Most likely EPFU
15-B (August 2)	1	0.02	0	n/a	No	Not Likely	LABO feeding buzz
35-B (August 9)	1	0.02	0	n/a	No	Not Likely	MYLU or LABO feeding buzz
38-B (August 10)	0	n/a	3	0.04	No	Not Likely	Fragmented calls with extraneous noise and few echolocation pulses
38-B (August 11)	0	n/a	13	<0.01	Yes	Possible	n/a
38-B (August 12)	2	0.03	15	<0.01	Yes	Probable	n/a
42-A (August 4)	0	n/a	5	0.01	Yes	Possible	n/a
47-A (August 9)	2	0.02	0	n/a	No	Not Likely	MYLU or LABO with feeding buzz
52-B (August 14	1	0.02	0	n/a	Yes	Possible	n/a
58-A (August 14)	0	n/a	3	0.01	No	Not Likely	LABO or MYLU. Low slope and variation in minimum frequency
58-A (August 16)	0	n/a	6	<0.01	No	Not Likely	LABO or MYLU. Low slope and variation in minimum frequency
Total	**10**	**n/a**	**46**	**n/a**	**n/a**	**n/a**	**n/a**

* Maximum Likelihood Estimate based on Britzke et al. 2002. A p-value less than 0.05 indicates statistical significance support for presence.

Key:
BCID = Bat Call Identification, Inc.
EPFU = big brown bat
LABO = eastern red bat
MYLU = little brown bat
n/a = not applicable

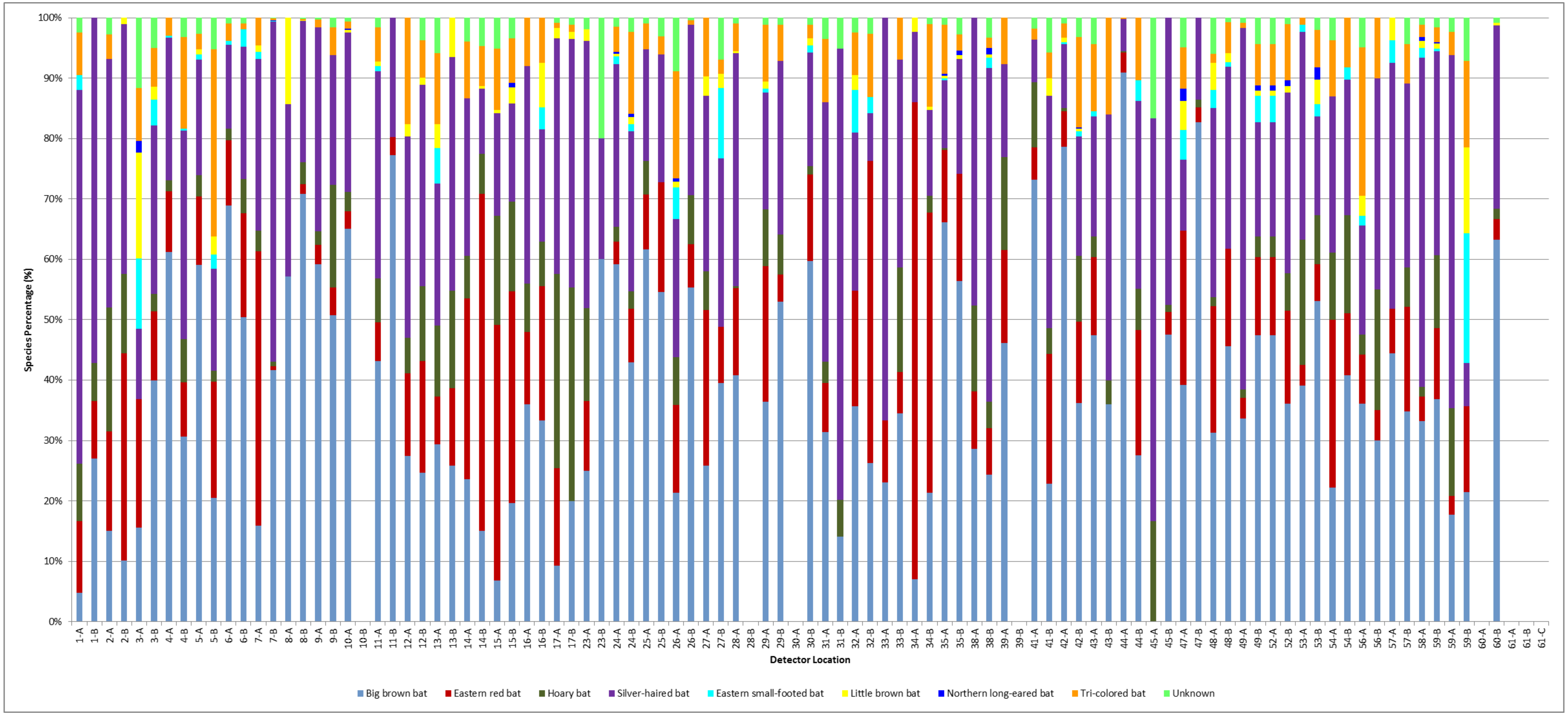

Figure 3-1 Species Composition Results from BCID per Detector Location

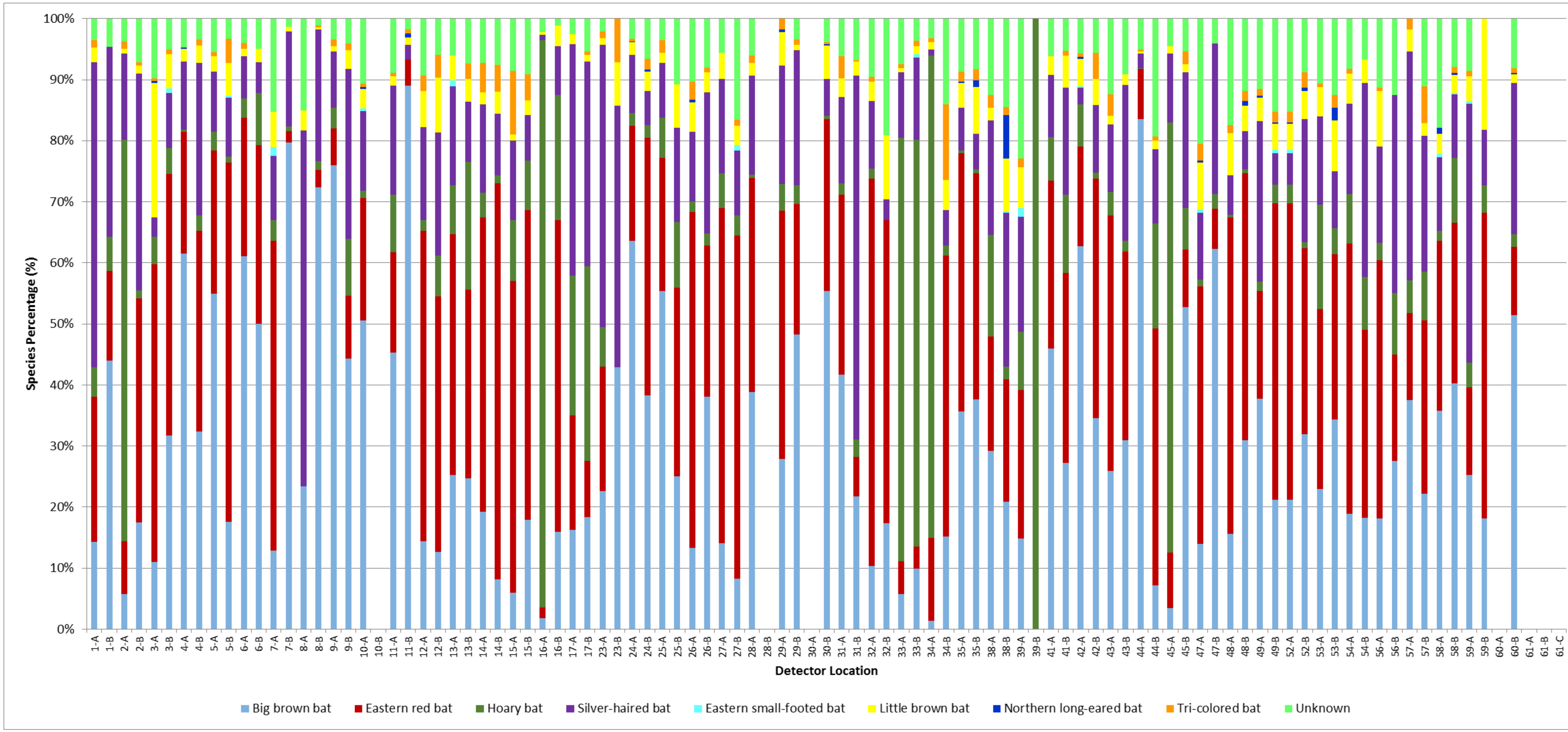

Figure 3-2 Species Composition Results from Kaleidoscope per Detector Location

4 Discussion

The acoustic bat survey suggests that the northern long-eared bat is potentially present within the Project Area during the summer. Call files from detector locations 38-B, 42-A, and 52-B were identified as northern long-eared bat by the automated classifiers and visually confirmed by E & E biologists; therefore, the presence of this species cannot be ruled out at these recording locations.

Each bat echolocation pulse has characteristics (e.g., slope and frequency) that can be measured quantitatively and used to match the call sequence to a species or species group. Although it is sometimes possible to distinguish species based on specific characteristics in the echolocation calls, factors, such as intraspecific variation and variation within a bat pass, make reliable identification difficult (Murray et al. 2001). Echolocation call characteristics may change depending on the sex, age, size, geographic location, and type/density of the habitat where the call is emitted (Thomas et al. 1987; Barclay and Brigham 1991; Jones and Ransome 1993; Broders et al. 2004). As such, examination of each bat call by a qualified bat biologist familiar with acoustic identification should be conducted as a general practice to confirm the identification output from the automated classifier(s).

Both automated classifiers used in this analysis, BCID and Kaleidoscope, were approved for use by the USFWS (USFWS 2015b). There are inherent differences between the algorithms used by each automated classifier to identify species and those differences are apparent in the results. BCID classified fewer calls as northern long-eared bats, but identified more potential detector nights as having significant MLE p-values as compared to Kaleidoscope, which record a higher number of call files from fewer sites. However, both programs agreed that call files recorded at site 38-B were produced by northern long-eared bats and this was visually confirmed by E & E bat biologists.

5 References

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A Detector Locations and Species Composition Results

Table A-1 2015 Ball Hill Wind Project Survey Effort

Detector Location Number	Detector Model	Microphone Type	Detector Sensitivity	Division Ratios	Detector Location Description	Detector Orientation	Detector Coordinate (Lat/Long)	Recording Dates	Survey Hours (24-Hour)	Total Number of Detector Nights	Number of Files Recorded
1-A	AnaBat SD1	Directional	6	8	Wooded Edge	North-Northeast	42.417414	29-Jul	2020-0606	2	366
							-79.152687	30-Jul	2020-0607		46
1-B	AnaBat SD1	Directional	7	8	Wooded Edge	East	42.416562	29-Jul	2020-0606	2	275
							-79.149953	30-Jul	2020-0607		136
2-A	AnaBat SD1	Directional	7	8	Agricultural Field	South	42.418269	29-Jul	2020-0606	2	2,454
							-79.156177	30-Jul	2020-0607		2,285
2-B	AnaBat SD2	Directional	7	8	Agricultural Field	South-Southwest	42.419371	29-Jul	2020-0606	2	703
							-79.154208	30-Jul	2020-0607		88
3-A	AnaBat SD1	Directional	7	8	Wooded Edge	East-Northeast	42.418382	31-Jul	2039-0607	2	1,335
							-79.142976	1-Aug	2039-0608		1,046
3-B	AnaBat SD1	Directional	7	8	Wooded Edge	East	42.419333	31-Jul	2039-0607	2	216
							-79.139864	1-Aug	2039-0608		155
4-A	AnaBat SD1	Directional	7	8	Field/Wooded Edge	Southwest	42.414694	31-Jul	2039-0607	2	555
							-79.141713	1-Aug	2039-0608		246
4-B	AnaBat SD2	Directional	7	8	Trail Head	West	42.413857	31-Jul	2039-0607	2	318
							-79.138872	1-Aug	2039-0608		212
5-A	AnaBat SD1	Directional	6	8	Field Edge	South-Southwest	42.416539	31-Jul	2039-0607	2	100
							-79.135647	1-Aug	2039-0608		88
5-B	AnaBat SD1	Directional	7	8	Wooded Edge	Northwest	42.418598	31-Jul	2039-0607	2	201
							-79.136868	1-Aug	2039-0608		165
6-A	AnaBat SD1	Directional	7	8	Wooded Edge/Corner	North	42.413608	31-Jul	2039-0607	2	299
							-79.136097	1-Aug	2039-0608		165
6-B	AnaBat SD1	Directional	6	8	Field/Wooded Edge	East	42.413603	31-Jul	2039-0607	2	79
							-79.134146	1-Aug	2039-0608		97
7-A	AnaBat SD1	Directional	7	8	Field Edge	East	42.410479	31-Jul	2039-0607	2	219
							-79.124824	1-Aug	2039-0608		107
7-B	AnaBat SD1	Directional	7	8	Field/Wooded Edge	South-Southwest	42.410780	31-Jul	2039-0607	2	386
							-79.131885	1-Aug	2039-0608		205
8-A	AnaBat SD1	Directional	7	8	Riparian	West-Northwest	42.406786	31-Jul	2039-0607	2	74
							-79.137492	1-Aug	2039-0608		26
8-B	AnaBat SD2	Directional	6	8	Riparian	Southeast	42.406110	31-Jul	2039-0607	2	773
							-79.135959	1-Aug	2039-0608		400

Table A-1 2015 Ball Hill Wind Project Survey Effort

Detector Location Number	Detector Model	Microphone Type	Detector Sensitivity	Division Ratios	Detector Location Description	Detector Orientation	Detector Coordinate (Lat/Long)	Recording Dates	Survey Hours (24-Hour)	Total Number of Detector Nights	Number of Files Recorded
9-A	AnaBat SD1	Directional	6	8	Field Edge	East	42.405907	31-Jul	2039-0607	2	307
							-79.129558	1-Aug	2039-0608		97
9-B	AnaBat SD1	Directional	7	8	Field Edge	West	42.405935	31-Jul	2039-0607	2	86
							-79.132794	1-Aug	2039-0608		56
10-A	AnaBat SD1	Directional	7	8	Field Edge	East-Northeast	42.404368	14-Aug	2015-0626	3	691
							-79.129167	15-Aug	2015-0626		347
								16-Aug	2015-0626		631
10-B	AnaBat SD1	Directional	7	8	Wooded Edge	Southwest	42.403159	14-Aug	2015-0626	3	2
							-79.130707	15-Aug	2015-0626		0
								16-Aug	2015-0626		0
11-A	AnaBat SD2	Directional	7	8	Field Edge	Southwest	42.405910	31-Jul	2039-0607	2	219
							-79.124089	1-Aug	2039-0608		107
11-B	AnaBat SD2	Directional	7	8	Trail Head	East	42.404875	31-Jul	2039-0607	2	386
							-79.126096	1-Aug	2039-0608		205
12-A	AnaBat SD2	Directional	6	8	Wooded Edge	Northeast	42.431763	5-Aug	2031-0614	2	24
							-79.109198	6-Aug	2031-0614		38
								7-Aug	2031-0614		92
12-B	AnaBat SD1	Directional	7	8	Field Corner/Forest Edge	Southeast	42.429944	5-Aug	2031-0614	2	70
							-79.110772	6-Aug	2031-0614		48
								7-Aug	2031-0614		78
13-A	AnaBat SD1	Directional	7	8	Field Corner	West	42.401154	2-Aug	2035-0610	3	19
							-79.160389	3-Aug	2035-0611		44
								4-Aug	2035-0611		91
13-B	AnaBat SD1	Directional	7	8	Wooded Edge	Southwest	42.400481	2-Aug	2035-0610	3	102
							-79.160558	3-Aug	2035-0611		53
								4-Aug	2035-0611		138
14-A	AnaBat SD2	Directional	7	8	Field Edge	South-Southeast	42.401151	2-Aug	2035-0610	3	149
							-79.167532	3-Aug	2035-0611		103
								4-Aug	2035-0611		174
14-B	AnaBat SD1	Directional	7	8	Wooded Edge	Southeast	42.399923	2-Aug	2035-0610	3	834
							-79.168021	3-Aug	2035-0611		253
								4-Aug	2035-0611		257

Table A-1 2015 Ball Hill Wind Project Survey Effort

Detector Location Number	Detector Model	Microphone Type	Detector Sensitivity	Division Ratios	Detector Location Description	Detector Orientation	Detector Coordinate (Lat/Long)	Recording Dates	Survey Hours (24-Hour)	Total Number of Detector Nights	Number of Files Recorded
15-A	AnaBat SD2	Directional	7	8	Field/Wooded Edge	South	42.398764	2-Aug	2035-0610	3	503
							-79.169638	3-Aug	2035-0611		268
								4-Aug	2035-0611		221
15-B	AnaBat SD1	Directional	7	8	Field/Wooded Edge	Northeast	42.397792	2-Aug	2035-0610	3	192
							-79.169421	3-Aug	2035-0611		57
								4-Aug	2035-0611		143
16-A	AnaBat SD1	Directional	7	8	Field Edge	Northwest	42.394535	2-Aug	2035-0610	3	2,541
							-79.165230	3-Aug	2035-0611		2,560
								4-Aug	2035-0611		2,174
16-B	AnaBat SD1	Directional	7	8	Field Edge	Southwest	42.395508	2-Aug	2035-0610	3	54
							-79.164201	3-Aug	2035-0611		49
								4-Aug	2035-0611		165
17-A	AnaBat SD1	Directional	6	8	Field Edge	South	42.397707	2-Aug	2035-0610	2	157
							-79.173267	3-Aug	2035-0611		142
								4-Aug	2035-0611		126
17-B	AnaBat SD1	Directional	7	8	Brush Field	Northwest	42.396532	2-Aug	2035-0610	3	170
							-79.175106	3-Aug	2035-0611		95
								4-Aug	2035-0611		87
23-A	AnaBat SD1	Directional	7	8	Gravel Road/Field	East-Northeast	42.390595	10-Aug	2023-0622	4	244
							-79.137684	11-Aug	2023-0622		25
								12-Aug	2023-0623		26
								13-Aug	2023-0625		39
23-B	AnaBat SD1	Directional	7	8	Field	Southeast	42.390046	10-Aug	2023-0622	4	3,125
							-79.139260	11-Aug	2023-0622		2,755
								12-Aug	2023-0623		553
								13-Aug	2023-0625		1,680
24-A	AnaBat SD1	Directional	7	8	Forest Edge	East	42.389147	2-Aug	2035-0610	3	415
							-79.137520	3-Aug	2035-0611		218
								4-Aug	2035-0611		293
24-B	AnaBat SD1	Directional	7	8	Trail Head	Northeast	42.387689	2-Aug	2035-0610	3	178
							-79.137863	3-Aug	2035-0611		124
								4-Aug	2035-0611		192

Table A-1 2015 Ball Hill Wind Project Survey Effort

Detector Location Number	Detector Model	Microphone Type	Detector Sensitivity	Division Ratios	Detector Location Description	Detector Orientation	Detector Coordinate (Lat/Long)	Recording Dates	Survey Hours (24-Hour)	Total Number of Detector Nights	Number of Files Recorded
25-A	AnaBat SD1	Directional	7	8	Wooded/Field Edge	East	42.385051	2-Aug	2035-0610	3	1,018
							-79.135861	3-Aug	2035-0611		511
								4-Aug	2035-0611		574
25-B	AnaBat SD2	Directional	6	8	Wooded Edge	Northeast	42.386391	2-Aug	2035-0610	3	103
							-79.135233	3-Aug	2035-0611		216
								4-Aug	2035-0611		213
26-A	AnaBat SD1	Directional	7	8	Field Corner	North-Northwest	42.436093	5-Aug	2031-0614	3	110
							-79.109965	6-Aug	2031-0614		148
								7-Aug	2031-0614		278
26-B	AnaBat SD1	Directional	7	8	Field Corner	South-Southeast	42.438672	5-Aug	2031-0614	3	163
							-79.110271	6-Aug	2031-0614		155
								7-Aug	2031-0614		163
27-A	AnaBat SD1	Directional	7	8	Field Edge	Northeast	42.433061	5-Aug	2031-0614	3	47
							-79.113038	6-Aug	2031-0614		15
								7-Aug	2031-0614		32
27-B	AnaBat SD1	Directional	7	8	Wooded Corridor	North	42.433702	5-Aug	2031-0614	3	71
							-79.111137	6-Aug	2031-0614		94
								7-Aug	2031-0614		161
28-A	AnaBat SD2	Directional	7	8	Wooded Edge	West	42.442010	5-Aug	2031-0614	3	333
							-79.117590	6-Aug	2031-0614		103
								7-Aug	2031-0614		178
28-B	AnaBat SD1	Directional	7	8	Field Edge	West	42.441015	5-Aug	2031-0614	3	2
							-79.118612	6-Aug	2031-0614		3
								7-Aug	2031-0614		0
29-A	AnaBat SD2	Directional	6	8	Field Edge	South-Southwest	42.443524	5-Aug	2031-0614	3	193
							-79.121589	6-Aug	2031-0614		79
								7-Aug	2031-0614		191
29-B	AnaBat SD1	Directional	7	8	Wooded Opening	Southwest	42.445805	5-Aug	2031-0614	3	82
							-79.121417	6-Aug	2031-0614		50
								7-Aug	2031-0614		126
30-A	AnaBat SD1	Directional	7	8	Field Edge	East-Southeast	42.441940	5-Aug	2031-0614	3	0
							-79.126764	6-Aug	2031-0614		0
								7-Aug	2031-0614		0

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Detector Location Number	Detector Model	Microphone Type	Detector Sensitivity	Division Ratios	Detector Location Description	Detector Orientation	Detector Coordinate (Lat/Long)	Recording Dates	Survey Hours (24-Hour)	Total Number of Detector Nights	Number of Files Recorded
30-B	AnaBat SD1	Directional	7	8	Field Edge, Above small stream	Southeast	42.441927	5-Aug	2031-0614	3	225
							-79.122889	6-Aug	2031-0614		113
								7-Aug	2031-0614		190
31-A	AnaBat SD1	Directional	7	8	Transmission Corridor	Southeast	42.436732	5-Aug	2031-0614	3	117
							-79.118733	6-Aug	2031-0614		77
								7-Aug	2031-0614		87
31-B	AnaBat SD1	Directional	7	8	Wooded Edge/Facing Corn Field	East	42.403228	14-Aug	2015-0626	3	773
							-79.122498	15-Aug	2015-0626		440
								16-Aug	2015-0626		0
32-A	AnaBat SD1	Directional	7	8	Wooded Edge	East	42.452256	8-Aug	2028-0617	2	177
							-79.113378	9-Aug	2028-0617		0
32-B	AnaBat SD1	Directional	7	8	Wooded Opening	Northeast	42.451081	8-Aug	2028-0617	2	80
							-79.113950	9-Aug	2028-0617		100
33-A	AnaBat SD2	Directional	7	8	Field Edge	West-Northwest	42.456489	10-Aug	2023-0622	4	6,159
							-79.107777	11-Aug	2023-0622		7,537
								12-Aug	2023-0623		4,324
								13-Aug	2023-0625		2
33-B	AnaBat SD1	Directional	7	8	Hill top	East	42.457184	10-Aug	2023-0622	4	4,817
							-79.107038	11-Aug	2023-0622		5,583
								12-Aug	2023-0623		2,239
								13-Aug	2023-0625		5,437
34-A	AnaBat SD1	Directional	6	8	Field Edge	West	42.455874	8-Aug	2028-0617	2	2,103
							-79.111127	9-Aug	2028-0617		3,585
34-B	AnaBat SD2	Directional	6	8	Field Edge	South	42.455602	8-Aug	2028-0617	2	557
							-79.109519	9-Aug	2028-0617		1,001
35-A	AnaBat SD1	Directional	7	8	Forest Edge	West	42.451818	8-Aug	2028-0617	2	167
							-79.116823	9-Aug	2028-0617		476
35-B	AnaBat SD1	Directional	7	8	Wooded Edge	South	42.452593	8-Aug	2028-0617	2	100
							-79.117689	9-Aug	2028-0617		464
38-A	AnaBat SD1	Directional	6	8	Field Edge	Southeast	42.385577	10-Aug	2023-0622	4	263
							-79.151634	11-Aug	2023-0622		0
								12-Aug	2023-0623		0
								13-Aug	2023-0625		0

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Detector Location Number	Detector Model	Microphone Type	Detector Sensitivity	Division Ratios	Detector Location Description	Detector Orientation	Detector Coordinate (Lat/Long)	Recording Dates	Survey Hours (24-Hour)	Total Number of Detector Nights	Number of Files Recorded
38-B	AnaBat SD2	Directional	7	8	Field Corner	West-Southwest	42.385006	10-Aug	2023-0622	4	1,021
							-79.149591	11-Aug	2023-0622		964
								12-Aug	2023-0623		207
								13-Aug	2023-0625		2
39-A	AnaBat SD1	Directional	7	8	Field Edge	West	42.409958	10-Aug	2023-0622	4	1
							-79.165684	11-Aug	2023-0622		5,797
								12-Aug	2023-0623		1,494
								13-Aug	2023-0625		7,592
39-B	AnaBat SD2	Directional	7	8	Field Edge	Northeast	42.409073	10-Aug	2023-0622	4	2
							-79.168642	11-Aug	2023-0622		804
								12-Aug	2023-0623		0
								13-Aug	2023-0625		7
41-A	AnaBat SD1	Directional	7	8	Field Edge	South-Southeast	42.397862	10-Aug	2023-0622	4	128
							-79.159758	11-Aug	2023-0622		33
								12-Aug	2023-0623		33
								13-Aug	2023-0625		84
41-B	AnaBat SD1	Directional	7	8	Grassy Corridor	Northeast	42.396872	10-Aug	2023-0622	4	197
							-79.160953	11-Aug	2023-0622		49
								12-Aug	2023-0623		34
								13-Aug	2023-0625		58
42-A	AnaBat SD1	Directional	7	8	Trail Head	West	42.420148	2-Aug	2035-0610	3	1,327
							-79.160163	3-Aug	2035-0611		495
								4-Aug	2035-0611		758
42-B	AnaBat SD2	Directional	7	8	Wooded Edge	Northeast	42.419408	5-Aug	2031-0614	3	402
							-79.158441	6-Aug	2031-0614		413
								7-Aug	2031-0614		405
43-A	AnaBat SD1	Directional	7	8	Field Edge	North-Northwest	42.424528	14-Aug	2015-0626	3	968
							-79.126966	15-Aug	2015-0626		368
								16-Aug	2015-0626		928
43-B	AnaBat SD1	Directional	7	8	Corridor/Field Edge	Southwest	42.426089	17-Aug	2017-0625	2	58
							-79.126630	18-Aug	2017-0626		87
44-A	AnaBat SD1	Directional	7	8	Wooded Opening	Southeast	42.452814	8-Aug	2028-0617	2	397
							-79.134751	9-Aug	2028-0617		465

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Detector Location Number	Detector Model	Microphone Type	Detector Sensitivity	Division Ratios	Detector Location Description	Detector Orientation	Detector Coordinate (Lat/Long)	Recording Dates	Survey Hours (24-Hour)	Total Number of Detector Nights	Number of Files Recorded
44-B	AnaBat SD1	Directional	6	8	Wooded Edge	West-Northwest	42.451370	8-Aug	2028-0617	2	1,917
							-79.133932	9-Aug	2028-0617		1,569
45-A	AnaBat SD1	Directional	6	8	Brush Field	Southeast	42.455918	8-Aug	2028-0617	2	2,968
							-79.119253	9-Aug	2028-0617		1,779
45-B	AnaBat SD2	Directional	7	8	Field Edge, Swamp Area	South	42.455365	8-Aug	2028-0617	2	124
							-79.120510	9-Aug	2028-0617		119
47-A	AnaBat SD1	Directional	6	8	Transmission Corridor	East	42.439842	8-Aug	2028-0617	2	172
							-79.134786	9-Aug	2028-0617		214
47-B	AnaBat SD1	Directional	7	8	Wooded Opening	Northeast	42.436991	8-Aug	2028-0617	2	71
							-79.133677	9-Aug	2028-0617		67
48-A	AnaBat SD1	Directional	7	8	Field Edge	Northwest	42.412772	8-Aug	2028-0617	2	130
							-79.111103	9-Aug	2028-0617		131
48-B	AnaBat SD1	Directional	7	8	Field Edge	West	42.410830	8-Aug	2028-0617	2	123
							-79.112293	9-Aug	2028-0617		229
49-A	AnaBat SD2	Directional	6	8	Wooded Edge	West	42.402602	14-Aug	2015-0626	3	6,854
							-79.107976	15-Aug	2015-0626		4,061
								16-Aug	2015-0626		7,175
49-B	AnaBat SD1	Directional	7	8	Field Edge	North-Northwest	42.403681	14-Aug	2015-0626	3	2,576
							-79.108010	15-Aug	2015-0626		705
								16-Aug	2015-0626		1,049
52-A	AnaBat SD1	Directional	7	8	Wooded Edge	North-Northwest	42.418456	14-Aug	2015-0626	3	2
							-79.119787	15-Aug	2015-0626		2
								16-Aug	2015-0626		0
52-B	AnaBat SD1	Directional	7	8	Field Edge	South	42.418796	14-Aug	2015-0626	3	1,392
							-79.121734	15-Aug	2015-0626		359
								16-Aug	2015-0626		808
53-A	AnaBat SD2	Directional	6	8	Transmission Corridor	Northwest	42.439420	8-Aug	2028-0617	2	116
							-79.129178	9-Aug	2028-0617		219
53-B	AnaBat SD2	Directional	7	8	Wetland	Southwest	42.437283	8-Aug	2028-0617	2	67
							-79.129407	9-Aug	2028-0617		67
54-A	AnaBat SD1	Directional	7	8	Field Edge	Northeast	42.401742	10-Aug	2023-0622	4	12
							-79.146727	11-Aug	2023-0622		103
								12-Aug	2023-0623		43
								13-Aug	2023-0625		84

Table A-1 2015 Ball Hill Wind Project Survey Effort

Detector Location Number	Detector Model	Microphone Type	Detector Sensitivity	Division Ratios	Detector Location Description	Detector Orientation	Detector Coordinate (Lat/Long)	Recording Dates	Survey Hours (24-Hour)	Total Number of Detector Nights	Number of Files Recorded
54-B	AnaBat SD1	Directional	7	8	Wooded Edge	South-Southeast	42.400426	10-Aug	2023-0622	4	7
							-79.146454	11-Aug	2023-0622		397
								12-Aug	2023-0623		30
								13-Aug	2023-0625		54
56-A	AnaBat SD2	Directional	6	8	Brush Field	West-Northwest	42.436212	10-Aug	2023-0622	4	112
							-79.112646	11-Aug	2023-0622		3,768
								12-Aug	2023-0623		246
								13-Aug	2023-0625		2,067
56-B	AnaBat SD1	Directional	7	8	Brush Field	East	42.410787	11-Aug	2023-0622	3	36
							-79.174340				8
								12-Aug	2023-0623		27
								13-Aug	2023-0625		2
57-A	AnaBat SD1	Directional	7	8	Field Edge	Southwest	42.389518	10-Aug	2023-0622	4	624
							-79.155310	11-Aug	2023-0622		175
								12-Aug	2023-0623		8
								13-Aug	2023-0625		20
57-B	AnaBat SD1	Directional	7	8	Field Corner	West	42.387880	10-Aug	2023-0622	4	443
							-79.156236	11-Aug	2023-0622		43
								12-Aug	2023-0623		38
								13-Aug	2023-0625		266
58-A	AnaBat SD1	Directional	6	8	Field Edge	South-Southwest	42.404711	14-Aug	2015-0626	3	947
							-79.119928	15-Aug	2015-0626		479
								16-Aug	2015-0626		650
58-B	AnaBat SD1	Directional	7	8	Trail Head/ Wooded Edge	North-Northeast	42.402634	14-Aug	2015-0626	3	804
							-79.119755	15-Aug	2015-0626		477
								16-Aug	2015-0626		696
59-A	AnaBat SD1	Directional	7	8	Above Small Pond	Northwest	42.436212	5-Aug	2031-0614	3	29
							-79.112646	6-Aug	2031-0614		513
								7-Aug	2031-0614		252
59-B	AnaBat SD1	Directional	7	8	Wooded Edge	South	42.439200	5-Aug	2031-0614	3	77
							-79.113542	6-Aug	2031-0614		0
								7-Aug	2031-0614		0
60-A	AnaBat SD1	Directional	7	8	Field Edge	West	42.424370	17-Aug	2017-0625	2	0
							-79.130215	18-Aug	2017-0626		0

Table A-1 2015 Ball Hill Wind Project Survey Effort

Detector Location Number	Detector Model	Microphone Type	Detector Sensitivity	Division Ratios	Detector Location Description	Detector Orientation	Detector Coordinate (Lat/Long)	Recording Dates	Survey Hours (24-Hour)	Total Number of Detector Nights	Number of Files Recorded
60-B	AnaBat SD1	Directional	6	8	Trail Head/Small Pond	North-Northeast	42.422147	14-Aug	2015-0626	3	708
							-79.127745	15-Aug	2015-0626		408
								16-Aug	2015-0626		405
61-A	AnaBat SD1	Directional	7	8	Field Edge	West-Northwest	42.420633	14-Aug	2015-0626	3	766
							-79.138730	15-Aug	2015-0626		0
								16-Aug	2015-0626		0
61-B	AnaBat SD1	Directional	7	8	Field Edge	Southeast	42.422393	14-Aug	2015-0626	3	849
							-79.141507	15-Aug	2015-0626		250
								16-Aug	2015-0626		306
61-C	AnaBat SD1	Directional	6	8	Field Edge	West	42.424447	17-Aug	2017-0625	2	9
							-79.141729	18-Aug	2017-0626		0
									Totals	**270**	**169,578**

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*)									Total
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	
1-A	July 29	1 (0.99)	1 (0.03)	2 (0.02)	18 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	2 (<0.01)	0 (n/a)	24
	July 30	1 (0.75)	4 (<0.01)	2 (<0.01)	8 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	1 (0.05)	1 (n/a)	18
1-B	July 29	11 (<0.01)	4 (<0.01)	1 (0.18)	17 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	33
	July 30	6 (0.01)	2 (<0.01)	3 (<0.01)	19 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	30
2-A	July 29	5 (0.09)	6 (<0.01)	11 (<0.01)	22 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.08)	2 (n/a)	47
	July 30	6 (<0.01)	6 (<0.01)	4 (<0.01)	8 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	2 (<0.01)	0 (n/a)	26
2-B	July 29	4 (0.26)	25 (<0.01)	1 (0.27)	24 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	54
	July 30	6 (0.01)	9 (<0.01)	12 (<0.01)	17 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	45
3-A	July 31	9 (<0.01)	9 (<0.01)	0 (n/a)	5 (<0.01)	4 (<0.01)	5 (<0.01)	0 (n/a)	4 (<0.01)	2 (n/a)	38
	August 1	7 (<0.01)	13 (<0.01)	0 (n/a)	7 (<0.01)	8 (<0.01)	13 (<0.01)	2 (0.16)	5 (<0.01)	10 (n/a)	65
3-B	July 31	32 (<0.01)	9 (<0.01)	0 (n/a)	24 (<0.01)	3 (<0.01)	2 (<0.01)	0 (n/a)	7 (<0.01)	5 (n/a)	82
	August 1	24 (<0.01)	7 (<0.01)	4 (<0.01)	15 (<0.01)	3 (<0.01)	1 (<0.01)	0 (n/a)	2 (<0.01)	2 (n/a)	58
4-A	July 31	130 (<0.01)	12 (<0.01)	2 (0.06)	35 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	5 (<0.01)	0 (n/a)	185
	August 1	36 (<0.01)	15 (<0.01)	3 (<0.01)	29 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	3 (<0.01)	0 (n/a)	86
4-B	July 31	69 (<0.01)	16 (<0.01)	6 (<0.01)	67 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	29 (<0.01)	7 (n/a)	195
	August 1	26 (<0.01)	12 (<0.01)	16 (<0.01)	40 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	18 (<0.01)	3 (n/a)	115
5-A	July 31	34 (<0.01)	5 (<0.01)	4 (<0.01)	12 (<0.01)	1 (<0.01)	1 (<0.01)	0 (n/a)	2 (<0.01)	1 (n/a)	60
	August 1	34 (<0.01)	8 (<0.01)	0 (n/a)	10 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.11)	2 (n/a)	55

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
5-B	July 31	18 (<0.01)	18 (<0.01)	1 (0.16)	15 (<0.01)	1 (<0.01)	4 (<0.01)	0 (n/a)	29 (<0.01)	5 (n/a)	91
	August 1	17 (<0.01)	15 (<0.01)	2 (0.01)	14 (<0.01)	3 (<0.01)	1 (<0.01)	0 (n/a)	24 (<0.01)	4 (n/a)	80
6-A	July 31	160 (<0.01)	25 (<0.01)	3 (<0.01)	21 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	5 (<0.01)	2 (n/a)	217
	August 1	57 (<0.01)	9 (<0.01)	3 (<0.01)	23 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	4 (<0.01)	1 (n/a)	98
6-B	July 31	26 (<0.01)	3 (<0.01)	4 (<0.01)	11 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	1 (0.04)	0 (n/a)	46
	August 1	27 (<0.01)	15 (<0.01)	2 (<0.01)	12 (<0.01)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	59
7-A	July 31	3 (0.10)	20 (<0.01)	2 (<0.01)	10 (<0.01)	1 (<0.01)	1 (<0.01)	0 (n/a)	1 (0.28)	0 (n/a)	38
	August 1	11 (<0.01)	20 (<0.01)	1 (0.16)	15 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	3 (<0.01)	0 (n/a)	50
7-B	July 31	248 (<0.01)	2 (<0.01)	4 (0.72)	317 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	2 (<0.01)	1 (n/a)	575
	August 1	88 (<0.01)	3 (<0.01)	2 (0.66)	137 (<0.01)	0 (n/a)	0 (n/a)	1 (0.02)	0 (n/a)	0 (n/a)	231
8-A	July 31	4 (<0.01)	0 (n/a)	0 (n/a)	1 (0.08)	0 (n/a)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	6
	August 1	0 (n/a)	0 (n/a)	0 (n/a)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1
8-B	July 31	508 (<0.01)	11 (<0.01)	7 (<0.01)	154 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.15)	1 (n/a)	682
	August 1	213 (<0.01)	5 (<0.01)	30 (<0.01)	85 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	1 (0.07)	1 (n/a)	336
9-A	July 31	141 (<0.01)	6 (<0.01)	3 (0.07)	82 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	3 (<0.01)	1 (n/a)	236
	August 1	43 (<0.01)	4 (<0.01)	4 (<0.01)	23 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.05)	0 (n/a)	75
9-B	July 31	20 (<0.01)	2 (<0.01)	3 (<0.01)	6 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.03)	0 (n/a)	32
	August 1	13 (<0.01)	1 (0.03)	8 (<0.01)	8 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	2 (<0.01)	1 (n/a)	33

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
10-A	August 14	325 (<0.01)	6 (n/a)	14 (<0.01)	137 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	2 (<0.01)	4 (n/a)	488
	August 15	100 (<0.01)	6 (<0.01)	10 (<0.01)	50 (<0.01)	0 (n/a)	1 (<0.01)	1 (0.02)	3 (<0.01)	1 (n/a)	172
	August 16	185 (<0.01)	15 (<0.01)	7 (<0.01)	60 (<0.01)	0 (n/a)	3 (<0.01)	1 (0.02)	6 (<0.01)	1 (n/a)	278
10-B	August 14***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 15***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 16***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
11-A	July 31	33 (<0.01)	6 (<0.01)	4 (<0.01)	24 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	3 (<0.01)	0 (n/a)	71
	August 1	21 (<0.01)	2 (<0.01)	5 (<0.01)	19 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	4 (<0.01)	2 (n/a)	54
11-B	July 31	47 (<0.01)	0 (n/a)	0 (n/a)	6 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	53
	August 1	31 (<0.01)	3 (<0.01)	0 (n/a)	14 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	48
12-A	August 5**	1 (0.31)	1 (0.04)	1 (0.03)	3 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	3 (<0.01)	0 (n/a)	9
	August 6	1 (0.50)	2 (<0.01)	2 (<0.01)	5 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.03)	0 (n/a)	11
	August 7	12 (<0.01)	4 (<0.01)	0 (n/a)	9 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	5 (<0.01)	0 (n/a)	31
12-B	August 5**	5 (<0.01)	9 (<0.01)	3 (<0.01)	5 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	0 (n/a)	1 (n/a)	24
	August 6	2 (0.34)	1 (0.03)	5 (<0.01)	10 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	2 (<0.01)	2 (n/a)	22
	August 7	13 (<0.01)	5 (<0.01)	2 (<0.01)	12 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	3 (<0.01)	0 (n/a)	35

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
		Species (MLE p-value*)									
13-A	August 2**	2 (<0.01)	1 (0.02)	0 (n/a)	0 (n/a)	0 (n/a)	2 (<0.01)	0 (n/a)	1 (0.02)	1 (n/a)	7
	August 3	8 (<0.01)	1 (0.02)	4 (<0.01)	5 (<0.01)	2 (<0.01)	0 (n/a)	0 (n/a)	1 (0.02)	0 (n/a)	21
	August 4	5 (<0.01)	2 (<0.01)	2 (<0.01)	7 (<0.01)	1 (<0.01)	0 (<0.01)	0 (n/a)	4 (<0.01)	2 (n/a)	23
13-B	August 2**	0 (n/a)	0 (n/a)	0 (n/a)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2
	August 3	4 (<0.01)	3 (<0.01)	3 (<0.01)	5 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	15
	August 4	4 (<0.01)	1 (<0.01)	2 (<0.01)	5 (<0.01)	0 (n/a)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	14
14-A	August 2**	2 (<0.01)	7 (<0.01)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2 (n/a)	13
	August 3	8 (<0.01)	12 (<0.01)	5 (<0.01)	8 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	7 (<0.01)	3 (n/a)	43
	August 4	20 (<0.01)	19 (<0.01)	2 (0.03)	25 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	5 (<0.01)	0 (n/a)	71
14-B	August 2	33 (<0.01)	236 (<0.01)	7 (<0.01)	6 (<0.01)	0 (n/a)	2 (<0.01)	0 (n/a)	27 (<0.01)	19 (n/a)	330
	August 3	26 (<0.01)	37 (<0.01)	15 (<0.01)	41 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	4 (<0.01)	3 (n/a)	126
	August 4	27 (<0.01)	47 (<0.01)	16 (<0.01)	15 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	7 (<0.01)	5 (n/a)	117
15-A	August 2**	2 (0.05)	2 (<0.01)	2 (<0.01)	3 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	2 (<0.01)	0 (n/a)	12
	August 3	6 (<0.01)	50 (<0.01)	9 (<0.01)	9 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	16 (<0.01)	8 (n/a)	98
	August 4	4 (0.16)	23 (<0.01)	21 (<0.01)	18 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (<0.01)	1 (n/a)	67
15-B	August 2	20 (<0.01)	19 (<0.01)	12 (<0.01)	12 (<0.01)	0 (n/a)	2 (<0.01)	1 (0.02)	9 (<0.01)	1 (n/a)	76
	August 3	3 (0.02)	9 (<0.01)	3 (<0.01)	5 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	1 (0.12)	0 (n/a)	22
	August 4	6 (<0.01)	24 (<0.01)	7 (<0.01)	7 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	1 (0.35)	4 (n/a)	50

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*) EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
16-A	August 2**	5 (<0.01)	0 (n/a)	1 (0.03)	3 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (<0.01)	0 (n/a)	10
	August 3	2 (0.07)	1 (<0.01)	0 (n/a)	4 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	7
	August 4	2 (0.03)	2 (<0.01)	1 (0.02)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.03)	0 (n/a)	8
16-B	August 2**	0 (n/a)	2 (<0.01)	1 (0.01)	1 (0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	4
	August 3	7 (<0.01)	3 (<0.01)	1 (0.03)	3 (<0.01)	1 (<0.01)	2 (<0.01)	0 (n/a)	1 (0.04)	0 (n/a)	18
	August 4	2 (0.01)	1 (0.02)	0 (n/a)	1 (0.04)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.02)	0 (n/a)	5
17-A	August 2**	2 (0.98)	11 (<0.01)	9 (<0.01)	22 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	1 (0.15)	0 (n/a)	46
	August 3	3 (0.13)	3 (<0.01)	16 (<0.01)	10 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	33
	August 4	6 (<0.01)	5 (<0.01)	13 (<0.01)	14 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	39
17-B	August 2**	7 (<0.01)	0 (n/a)	7 (<0.01)	15 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	30
	August 3	5(0.01)	0(n/a)	15 (<0.01)	11 (<0.01)	0(n/a)	1 (<0.01)	0(n/a)	1 (<0.01)	0(n/a)	33
	August 4	5 (<0.01)	0 (n/a)	8 (<0.01)	9 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	22
23-A	August 10**	6 (<0.01)	1 (<0.01)	5 (<0.01)	5 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	18
	August 11**	1 (0.12)	0 (n/a)	1 (0.01)	1 (0.03)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	3
	August 12**	4 (0.02)	1 (<0.01)	0 (n/a)	9 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	14
	August 13	2 (0.23)	4 (<0.01)	2 (<0.01)	8 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	17

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
23-B	August 10**	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)
	August 11**	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)
	August 12**	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)
	August 13	3 (<0.01)	0 (n/a)	0 (n/a)	1 (0.06)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	5
24-A	August 2	129 (<0.01)	10 (<0.01)	8 (<0.01)	96 (<0.01)	3 (<0.01)	0 (n/a)	0 (n/a)	19 (<0.01)	4 (n/a)	269
	August 3	156 (<0.01)	8 (<0.01)	5 (<0.01)	50 (<0.01)	1 (0.01)	1 (<0.01)	1 (0.09)	2 (<0.01)	2 (n/a)	226
	August 4	132 (<0.01)	8 (<0.01)	4 (<0.01)	44 (<0.01)	5 (<0.01)	2 (<0.01)	1 (0.40)	9 (<0.01)	4 (n/a)	209
24-B	August 2	34 (<0.01)	9 (<0.01)	2 (0.01)	14 (<0.01)	2 (<0.01)	1 (<0.01)	1 (0.17)	6 (<0.01)	1 (n/a)	70
	August 3	15 (<0.01)	1 (0.15)	1 (0.23)	21 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	11 (<0.01)	3 (n/a)	53
	August 4	24 (<0.01)	5 (<0.01)	2 (<0.01)	10 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	6 (<0.01)	0 (n/a)	47
25-A	August 2**	37 (<0.01)	1 (<0.01)	2 (<0.01)	13 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2 (n/a)	55
	August 3	83 (<0.01)	9 (<0.01)	7 (<0.01)	25 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	7 (<0.01)	0 (n/a)	131
	August 4	70 (<0.01)	18 (<0.01)	8 (<0.01)	19 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	6 (<0.01)	1 (n/a)	122
25-B	August 2**	5 (<0.01)	0 (n/a)	0 (n/a)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	7
	August 3	6 (<0.01)	2 (<0.01)	0 (n/a)	3 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.03)	1 (n/a)	13
	August 4	7 (<0.01)	4 (<0.01)	0 (n/a)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	13

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*)									Total
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	
26-A	August 5**	5 (<0.01)	4 (<0.01)	4 (<0.01)	6 (<0.01)	1 (<0.01)	1 (<0.01)	0 (n/a)	8 (<0.01)	3 (n/a)	32
	August 6	11 (<0.01)	13 (<0.01)	7 (<0.01)	15 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	10 (<0.01)	6 (n/a)	62
	August 7	25 (<0.01)	11 (<0.01)	4 (<0.01)	23 (<0.01)	9 (<0.01)	1 (<0.01)	1 (0.69)	16 (<0.01)	8 (n/a)	98
26-B	August 5**	27 (<0.01)	10 (<0.01)	4 (<0.01)	12 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	53
	August 6	60 (<0.01)	5 (<0.01)	15 (<0.01)	20 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.07)	1 (n/a)	102
	August 7	62 (<0.01)	4 (<0.01)	3 (0.01)	44 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.05)	0 (n/a)	114
27-A	August 5**	1 (0.02)	3 (<0.01)	2 (<0.01)	0 (n/a)	0 (n/a)	1 (<0.01)	0 (n/a)	3 (<0.01)	0 (n/a)	10
	August 6	2 (0.01)	2 (<0.01)	0 (n/a)	1 (0.04)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	5
	August 7	5 (<0.01)	3 (<0.01)	0 (n/a)	8 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	16
27-B	August 5**	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	2 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	5
	August 6	4 (<0.01)	2 (<0.01)	0 (n/a)	3 (<0.01)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	12
	August 7	11 (<0.01)	2 (<0.01)	0 (n/a)	9 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	1 (0.03)	2 (n/a)	26
28-A	August 5**	58 (<0.01)	38 (<0.01)	0 (n/a)	69 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	4 (<0.01)	2 (n/a)	171
	August 6	8 (<0.01)	6 (<0.01)	0 (n/a)	9 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	4 (<0.01)	1 (n/a)	28
	August 7	67 (<0.01)	3 (<0.01)	1 (0.54)	48 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	7 (<0.01)	0 (n/a)	127
28-B	August 5***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 6***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 7***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
		Species (MLE p-value*)									
29-A	August 5**	15 (<0.01)	22 (<0.01)	1 (0.08)	8 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	6 (<0.01)	2 (n/a)	55
	August 6	11 (<0.01)	3 (<0.01)	7 (<0.01)	10 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	5 (<0.01)	0 (n/a)	36
	August 7	36 (<0.01)	13 (<0.01)	8(<0.01)	15 (<0.01)	1 (<0.01)	1 (<0.01)	0(n/a)	5 (<0.01)	0(n/a)	79
29-B	August 5**	36 (<0.01)	2 (<0.01)	2 (<0.01)	8 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	3 (<0.01)	0 (n/a)	51
	August 6	7 (<0.01)	3 (<0.01)	7 (<0.01)	15 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	2 (<0.01)	1 (n/a)	35
	August 7	53 (<0.01)	3 (<0.01)	3 (<0.01)	29 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	6 (<0.01)	1 (n/a)	95
30-A	August 5***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 6***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 7***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
30-B	August 5	96 (<0.01)	23 (<0.01)	0 (n/a)	12 (<0.01)	4 (<0.01)	3 (<0.01)	0 (n/a)	5 (<0.01)	3 (n/a)	146
	August 6	39 (<0.01)	19 (<0.01)	3 (<0.01)	19 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	0 (n/a)	1 (n/a)	82
	August 7	74 (<0.01)	8 (<0.01)	2 (0.06)	35 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	3 (<0.01)	0 (n/a)	122
31-A	August 5**	7 (<0.01)	5 (<0.01)	0 (n/a)	6 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	9 (<0.01)	2 (n/a)	29
	August 6	9 (<0.01)	2 (<0.01)	3 (<0.01)	14 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	29
	August 7	11 (<0.01)	0 (n/a)	0 (n/a)	17 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	28
31-B	August 14	13 (0.09)	0 (n/a)	1 (0.96)	89 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	5 (n/a)	108
	August 15	12 (<0.01)	0 (n/a)	10 (<0.01)	44 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	4 (n/a)	70
	August 16***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*) EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
32-A	August 8	15 (<0.01)	8 (<0.01)	0 (n/a)	11 (<0.01)	3 (<0.01)	1 (<0.01)	0 (n/a)	3 (<0.01)	1 (n/a)	42
	August 9***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
32-B	August 8	4 (<0.01)	1 (<0.01)	0 (n/a)	1 (0.08)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	7
	August 9	6 (<0.01)	18 (<0.01)	0 (n/a)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	4 (<0.01)	1 (n/a)	31
33-A	August 10**	6 (<0.01)	3 (<0.01)	0 (n/a)	12 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	21
	August 11**	3 (0.07)	1 (<0.01)	0 (n/a)	9 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	13
	August 12**	0 (n/a)	0 (n/a)	0 (n/a)	5 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	5
	August 13***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
33-B	August 10**	1 (0.14)	1 (0.02)	3 (<0.01)	1 (0.05)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.02)	0 (n/a)	7
	August 11**	4 (<0.01)	1 (0.02)	1 (0.01)	1 (0.09)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.02)	0 (n/a)	8
	August 12**	4 (<0.01)	0 (n/a)	0 (n/a)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	6
	August 13	1 (0.58)	0 (n/a)	1 (0.06)	6 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	8
34-A	August 8	0 (n/a)	1 (<0.01)	0 (n/a)	3 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	5
	August 9	3 (<0.01)	33 (<0.01)	0 (n/a)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	38
34-B	August 8	6 (<0.01)	15 (<0.01)	2 (<0.01)	7 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	6 (<0.01)	0 (n/a)	36
	August 9	33 (<0.01)	70 (<0.01)	3 (<0.01)	19 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	19 (<0.01)	2 (n/a)	147
35-A	August 8	24 (<0.01)	9 (<0.01)	0 (n/a)	8 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	7 (<0.01)	0 (n/a)	48
	August 9	148 (<0.01)	22 (<0.01)	1 (0.20)	21 (<0.01)	1 (0.01)	1 (<0.01)	1 (0.09)	14 (<0.01)	3 (n/a)	212

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
35-B	August 8	18 (<0.01)	3 (<0.01)	0 (n/a)	2 (0.06)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.04)	0 (n/a)	24
	August 9	65 (<0.01)	23 (<0.01)	0 (n/a)	26 (<0.01)	0 (n/a)	1 (<0.01)	1 (0.02)	3 (<0.01)	4 (n/a)	123
38-A	August 10**	6 (<0.01)	2 (<0.01)	3 (<0.01)	10 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	21
	August 11***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 12***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 13***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
38-B	August 10	14 (<0.01)	2 (<0.01)	2 (0.20)	64 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.03)	1 (n/a)	84
	August 11	21 (<0.01)	5 (<0.01)	4 (<0.01)	28 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	58
	August 12	9 (<0.01)	7(<0.01)	2(<0.01)	8 (<0.01)	3 (<0.01)	1 (<0.01)	2 (0.03)	2 (<0.01)	5(n/a)	39
	August 13***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
39-A	August 10**	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0
	August 11**	0 (n/a)	1 (<0.01)	1 (0.01)	1 (0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	3
	August 12**	4 (<0.01)	1 (0.02)	1 (0.01)	1 (0.09)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.02)	0 (n/a)	8
	August 13	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2
39-B	August 10**	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0
	August 11***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 12***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 13***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
41-A	August 10**	2 (0.03)	1 (<0.01)	1 (0.02)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	6
	August 11**	9 (<0.01)	0 (n/a)	4 (<0.01)	1 (0.22)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	14
	August 12**	13 (<0.01)	0 (n/a)	1 (0.01)	1 (0.27)	0 (n/a)	0 (n/a)	0 (n/a)	1 (<0.01)	0 (n/a)	16
	August 13	17 (<0.01)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	20
41-B	August 10**	4 (<0.01)	2 (<0.01)	2 (<0.01)	7 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	16
	August 11**	2 (0.11)	2 (<0.01)	1 (0.05)	5 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	2 (<0.01)	2 (n/a)	15
	August 12**	4 (<0.01)	5 (<0.01)	0 (n/a)	3 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	13
	August 13	6 (<0.01)	6 (<0.01)	0 (n/a)	12 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.08)	1 (n/a)	26
42-A	August 2	1009 (<0.01)	39 (<0.01)	3 (0.09)	104 (<0.01)	3 (<0.01)	11 (<0.01)	0 (n/a)	11 (<0.01)	7 (n/a)	1187
	August 3	140 (<0.01)	33 (<0.01)	4 (<0.01)	35 (<0.01)	2 (<0.01)	1 (<0.01)	0 (n/a)	21 (<0.01)	4 (n/a)	240
	August 4	158 (<0.01)	27 (<0.01)	1 (0.39)	37 (<0.01)	1 (0.01)	0 (n/a)	1 (0.09)	7 (<0.01)	4 (n/a)	236
42-B	August 5**	91 (<0.01)	26 (<0.01)	16 (<0.01)	44 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	26 (<0.01)	7 (n/a)	210
	August 6	52 (<0.01)	31 (<0.01)	26 (<0.01)	39 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	57 (<0.01)	8 (n/a)	214
	August 7	110 (<0.01)	37 (<0.01)	34 (<0.01)	55 (<0.01)	5 (<0.01)	3 (<0.01)	1 (0.40)	22 (<0.01)	7 (n/a)	274
43-A	August 14	11 (<0.01)	1 (<0.01)	0 (n/a)	6 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	19
	August 15	28 (<0.01)	12 (<0.01)	2 (<0.01)	6 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	8 (<0.01)	1 (n/a)	58
	August 16**	16 (<0.01)	2 (<0.01)	2 (<0.01)	11 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	5 (<0.01)	3 (n/a)	39

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*) EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
43-B	August 17**	7 (<0.01)	0 (n/a)	1 (0.09)	9 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	4 (<0.01)	0 (n/a)	21
	August 18**	2 (0.03)	0 (n/a)	0 (n/a)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	4
44-A	August 8	230 (<0.01)	3 (<0.01)	1 (0.21)	23 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	257
	August 9	325 (<0.01)	17 (<0.01)	0 (n/a)	10 (0.15)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.24)	0 (n/a)	353
44-B	August 8	2 (0.19)	5 (<0.01)	1 (0.07)	7 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	3 (<0.01)	0 (n/a)	19
	August 9	6 (<0.01)	1 (<0.01)	1 (0.02)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (<0.01)	0 (n/a)	10
45-A	August 8	0 (n/a)	0 (n/a)	1 (0.03)	3 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	4
	August 9	0 (n/a)	0 (n/a)	0 (n/a)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	2
45-B	August 8	7 (<0.01)	1 (<0.01)	0 (n/a)	11 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	19
	August 9	31 (<0.01)	2 (<0.01)	1 (0.30)	27 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	61
47-A	August 8	16 (<0.01)	9 (<0.01)	0 (n/a)	11 (<0.01)	3 (<0.01)	2 (<0.01)	0 (n/a)	2 (<0.01)	2 (n/a)	45
	August 9	24 (<0.01)	17 (<0.01)	0 (n/a)	1 (0.48)	2 (<0.01)	3 (<0.01)	2 (0.02)	5 (<0.01)	3 (n/a)	57
47-B	August 8	42 (<0.01)	0 (n/a)	0 (n/a)	5 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	47
	August 9	25 (<0.01)	2 (<0.01)	1 (0.06)	6 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	34
48-A	August 8	11 (<0.01)	3 (<0.01)	0 (n/a)	12 (<0.01)	1 (<0.01)	3 (<0.01)	0 (n/a)	0 (n/a)	1 (n/a)	31
	August 9	10(<0.01)	11(<0.01)	1(0.09)	9(<0.01)	1(<0.01)	0(n/a)	0(n/a)	1(0.15)	3(n/a)	36
48-B	August 8	18 (<0.01)	5 (<0.01)	0 (n/a)	9 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	3 (<0.01)	1 (n/a)	37
	August 9	44 (<0.01)	17 (<0.01)	0 (n/a)	32 (<0.01)	1 (<0.01)	1 (<0.01)	0 (n/a)	4 (<0.01)	0 (n/a)	99

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
49-A	August 14	32 (<0.01)	1 (<0.01)	1 (0.99)	100 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	3 (n/a)	137
	August 15	56 (<0.01)	10 (<0.01)	4 (<0.01)	53 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	3 (<0.01)	0 (n/a)	126
	August 16	30 (<0.01)	1 (<0.01)	0 (n/a)	57 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	88
49-B	August 14	10 (<0.01)	4 (<0.01)	3 (<0.01)	13 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	32
	August 15	25 (<0.01)	10 (<0.01)	1 (0.05)	5 (<0.01)	2 (<0.01)	1 (<0.01)	1 (0.17)	6 (<0.01)	4 (n/a)	55
	August 16	20 (<0.01)	1 (0.03)	0 (n/a)	4 (<0.01)	2 (<0.01)	0 (n/a)	0 (n/a)	2 (<0.01)	0 (n/a)	29
52-A	August 14	10 (<0.01)	4 (<0.01)	3 (<0.01)	13 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	32
	August 15	25 (<0.01)	10 (<0.01)	1 (0.05)	5 (<0.01)	2 (<0.01)	1 (<0.01)	1 (0.17)	6 (<0.01)	4 (n/a)	55
	August 16	20 (<0.01)	1 (0.03)	0 (n/a)	4 (<0.01)	2 (<0.01)	0 (n/a)	0 (n/a)	2 (<0.01)	0 (n/a)	29
52-B	August 14	13 (<0.01)	4 (<0.01)	2 (<0.01)	10 (<0.01)	0 (n/a)	0 (n/a)	1 (0.02)	1 (0.05)	0 (n/a)	31
	August 15	13 (<0.01)	5 (<0.01)	2 (<0.01)	7 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	4 (<0.01)	0 (n/a)	31
	August 16	9 (<0.01)	6 (<0.01)	2 (<0.01)	12 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	4 (<0.01)	1 (n/a)	35
53-A	August 8	14 (<0.01)	0 (n/a)	18 (<0.01)	12 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	44
	August 9	20 (<0.01)	3 (<0.01)	0 (n/a)	18 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	1 (0.04)	0 (n/a)	43
53-B	August 8	21 (<0.01)	1 (0.02)	1 (0.05)	5 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.02)	0 (n/a)	29
	August 9	5 (<0.01)	2 (<0.01)	3 (<0.01)	3 (<0.01)	1 (0.01)	2 (<0.01)	1 (0.09)	2 (<0.01)	1 (n/a)	20

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
54-A	August 10**	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0
	August 11**	8 (<0.01)	1 (<0.01)	1 (0.04)	4 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	15
	August 12**	1 (0.42)	4 (<0.01)	3 (<0.01)	4 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	2 (<0.01)	1 (n/a)	15
	August 13	3 (0.03)	10 (<0.01)	2 (<0.01)	6 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	3 (<0.01)	0 (n/a)	24
54-B	August 10**	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0
	August 11**	10 (<0.01)	1 (0.03)	2 (<0.01)	1 (0.22)	1 (<0.01)	0 (n/a)	0 (n/a)	2 (<0.01)	0 (n/a)	17
	August 12**	8 (<0.01)	1 (<0.01)	5 (<0.01)	3 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	17
	August 13	2 (0.19)	3 (<0.01)	1 (0.07)	7 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	2 (<0.01)	0 (n/a)	15
56-A	August 10**	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0
	August 11**	15 (<0.01)	0 (n/a)	1 (0.05)	5 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	5 (<0.01)	0 (n/a)	26
	August 12**	4 (<0.01)	5 (<0.01)	0 (n/a)	4 (<0.01)	1 (<0.01)	2 (<0.01)	0 (n/a)	9 (<0.01)	3 (n/a)	28
	August 13	3 (<0.01)	0 (n/a)	1 (0.02)	2 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (<0.01)	0 (n/a)	7
56-B	August 11**	2 (0.05)	0 (n/a)	2 (<0.01)	3 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	7
	August 12**	0 (n/a)	1 (0.02)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.02)	0 (n/a)	3
	August 13	4 (<0.01)	0(n/a)	1(0.04)	4 (<0.01)	0(n/a)	0(n/a)	0(n/a)	1 (<0.01)	0(n/a)	10

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
		Species (MLE p-value*)									
57-A	August 10**	5 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	6
	August 11**	2 (0.14)	1 (<0.01)	0 (n/a)	6 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	9
	August 12**	2 (0.05)	0 (n/a)	0 (n/a)	3 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	5
	August 13	3 (<0.01)	1 (<0.01)	0 (n/a)	2 (<0.01)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	7
57-B	August 10**	2 (0.08)	1 (<0.01)	2 (<0.01)	4 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	9
	August 11**	6 (<0.01)	2 (<0.01)	1 (0.06)	6 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	2 (<0.01)	0 (n/a)	17
	August 12**	2 (0.05)	3 (<0.01)	0 (n/a)	3 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.04)	1 (n/a)	10
	August 13	6 (<0.01)	2 (<0.01)	0 (n/a)	1 (0.12)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	10
58-A	August 14	56 (<0.01)	1 (0.04)	3 (0.23)	128 (<0.01)	2 (<0.01)	2 (<0.01)	1 (0.17)	2 (<0.01)	0 (n/a)	195
	August 15	43 (<0.01)	4 (<0.01)	3 (<0.01)	32 (<0.01)	1 (0.01)	1 (<0.01)	1 (0.09)	2 (<0.01)	2 (n/a)	89
	August 16	47 (<0.01)	13 (<0.01)	1 (0.87)	80 (<0.01)	4 (<0.01)	2 (<0.01)	1 (0.32)	5 (<0.01)	3 (n/a)	156
58-B	August 14	177 (<0.01)	13 (<0.01)	91 (<0.01)	183 (<0.01)	1 (0.01)	2 (<0.01)	1 (0.09)	3 (<0.01)	7 (n/a)	478
	August 15	94 (<0.01)	43 (<0.01)	17 (<0.01)	48 (<0.01)	0 (n/a)	3 (<0.01)	0 (n/a)	13 (<0.01)	3 (n/a)	221
	August 16	109 (<0.01)	65 (<0.01)	17 (<0.01)	117 (<0.01)	3 (<0.01)	4 (<0.01)	1 (0.25)	10 (<0.01)	6 (n/a)	332
59-A	August 5**	3 (0.01)	1 (0.02)	1 (0.04)	4 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.02)	1 (n/a)	11
	August 6	11 (<0.01)	0 (n/a)	14 (<0.01)	32 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (<0.01)	1 (n/a)	59
	August 7	9 (0.02)	3 (<0.01)	4 (<0.01)	40 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	3 (<0.01)	1 (n/a)	60

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
59-B	August 5**	3 (<0.01)	2 (<0.01)	0 (n/a)	1 (0.06)	3 (<0.01)	2 (<0.01)	0 (n/a)	2 (<0.01)	1 (n/a)	14
	August 6***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 7***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
60-A	August 17***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 18***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
60-B	August 14	64 (<0.01)	1 (<0.01)	1 (0.33)	30 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	96
	August 15	43 (<0.01)	4 (<0.01)	3 (<0.01)	16 (<0.01)	0 (n/a)	1 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	67
	August 16**	41 (<0.01)	3 (<0.01)	0 (n/a)	25 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2 (n/a)	71
61-A	August 14***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 15***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 16***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
61-B	August 14***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 15***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	August 16***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table A-2 Species Identification Results - BCID

Detector Location	Survey Date	Species (MLE p-value*) EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
61-C	August 17***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	August 18***	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a	-- n/a
	Total Bat Passes	**8,501**	**1,991**	**869**	**4,768**	**128**	**129**	**27**	**799**	**303**	**17,515**

Note: A successful night is defined as a night when weather conditions met the USFWS Guidelines and/or a call was identified as a northern long-eared bat in either or both programs.

* Maximum Likelihood Estimate based on Britzke et al. 2002. A p-value less than 0.05 indicate statistical significance support for presence. P-values are presented to the nearest hundredth. P-values the program identified as 0.00 are presented in the table as <0.01. P-values the program identified as 0.99 or greater are presented in the table as 1.00.

** Unsuccessful acoustic night due to wind and/or rain during the survey period.

*** Unsuccessful acoustic night due to detector malfunction.

Key:

EPFU = Big brown bat	MYLE = Eastern small-footed bat
LABO = Eastern red bat	MYLU = Little brown bat
LACI = Hoary bat	MYSE = Northern long-eared bat
LANO = Silver-haired bat	PESU = Tri-colored bat

Table A-3 Species Identification Results - Kaleidoscope

		Species (MLE p-value*)									
Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
1-A	July 29	6 (0.99)	10 (<0.01)	0 (n/a)	34 (<0.01)	0 (n/a)	1 (0.98)	0 (n/a)	0 (n/a)	2 (n/a)	53
	July 30	6 (0.05)	10 (<0.01)	4 (<0.01)	8 (0.03)	0 (n/a)	1 (0.99)	0 (n/a)	1 (0.58)	1 (n/a)	31
1-B	July 29	29 (<0.01)	10 (<0.01)	1 (0.80)	16 (0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	3 (n/a)	59
	July 30	19 (<0.01)	6 (<0.01)	5 (<0.01)	18 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2 (n/a)	50
2-A	July 29	15 (0.33)	23 (<0.01)	48 (<0.01)	53 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	3 (0.10)	8 (n/a)	150
	July 30	14 (1.00)	21 (<0.01)	286 (<0.01)	19 (1.00)	0 (n/a)	4 (0.42)	0 (n/a)	3 (0.09)	11 (n/a)	358
2-B	July 29	10 (0.35)	35 (<0.01)	0 (n/a)	31 (<0.01)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	7 (n/a)	84
	July 30	17 (<0.01)	22 (<0.01)	2 (0.20)	24 (<0.01)	0 (n/a)	1 (1.00)	0 (n/a)	1 (0.90)	4 (n/a)	71
3-A	July 31	16 (<0.01)	53 (<0.01)	9 (<0.01)	2 (1.00)	0 (n/a)	19 (<0.01)	0 (n/a)	1 (1.00)	10 (n/a)	110
	August 1	11 (<0.01)	67 (<0.01)	2 (0.10)	6 (0.24)	0 (n/a)	35 (<0.01)	1 (0.99)	0 (n/a)	14 (n/a)	136
3-B	July 31	46 (<0.01)	64 (<0.01)	3 (0.12)	12 (0.80)	1 (1.00)	7 (0.81)	0 (n/a)	2 (0.98)	4 (n/a)	139
	August 1	35 (<0.01)	45 (<0.01)	8 (<0.01)	11 (0.79)	1 (1.00)	7 (0.34)	0 (n/a)	0 (n/a)	9 (n/a)	116
4-A	July 31	162 (<0.01)	37 (<0.01)	0 (n/a)	15 (1.00)	0 (n/a)	5 (0.61)	0 (n/a)	0 (n/a)	6 (n/a)	225
	August 1	47 (<0.01)	31 (<0.01)	1 (0.96)	23 (<0.01)	0 (n/a)	2 (1.00)	1 (0.12)	0 (n/a)	10 (n/a)	115

Table A-3 Species Identification Results - Kaleidoscope

		Species (MLE p-value*)									
Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
4-B	July 31	105 (<0.01)	90 (<0.01)	5 (0.13)	60 (<0.01)	0 (n/a)	9 (0.87)	0 (n/a)	3 (0.95)	7 (n/a)	279
	August 1	48 (<0.01)	65 (<0.01)	7 (<0.01)	58 (<0.01)	0 (n/a)	4 (1.00)	0 (n/a)	2 (0.98)	9 (n/a)	193
5-A	July 31	41 (<0.01)	19 (<0.01)	4 (0.01)	11 (0.85)	0 (n/a)	3 (0.64)	0 (n/a)	1 (0.85)	4 (n/a)	83
	August 1	48 (<0.01)	19 (<0.01)	1 (0.92)	5 (1.00)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	5 (n/a)	79
5-B	July 31	30 (<0.01)	83 (<0.01)	3 (0.06)	10 (0.50)	0 (n/a)	11 (0.41)	0 (n/a)	6 (0.13)	10 (n/a)	153
	August 1	23 (<0.01)	94 (<0.01)	0 (n/a)	19 (<0.01)	1 (1.00)	5 (1.00)	0 (n/a)	6 (0.19)	10 (n/a)	148
6-A	July 31	172 (<0.01)	57 (<0.01)	6 (0.13)	19 (1.00)	0 (n/a)	1 (1.00)	0 (n/a)	3 (0.58)	7 (n/a)	265
	August 1	76 (<0.01)	35 (<0.01)	7 (<0.01)	9 (1.00)	0 (n/a)	4 (0.84)	0 (n/a)	1 (1.00)	9 (n/a)	141
6-B	July 31	36 (<0.01)	12 (<0.01)	8 (<0.01)	1 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	3 (n/a)	60
	August 1	34 (<0.01)	29 (<0.01)	4 (0.01)	6 (1.00)	0 (n/a)	3 (0.92)	0 (n/a)	0 (n/a)	4 (n/a)	80
7-A	July 31	11 (<0.01)	61 (<0.01)	3 (<0.01)	8 (0.07)	2 (1.00)	9 (0.31)	0 (n/a)	0 (n/a)	23 (n/a)	117
	August 1	16 (<0.01)	45 (<0.01)	4 (<0.01)	14 (<0.01)	1 (1.00)	3 (1.00)	0 (n/a)	0 (n/a)	9 (n/a)	92
7-B	July 31	493 (<0.01)	9 (<0.01)	2 (1.00)	98 (1.00)	0 (n/a)	3 (0.26)	0 (n/a)	0 (n/a)	8 (n/a)	613
	August 1	196 (<0.01)	8 (<0.01)	4 (0.71)	37 (1.00)	0 (n/a)	3 (0.17)	0 (n/a)	0 (n/a)	4 (n/a)	252

Table A-3 Species Identification Results - Kaleidoscope

		Species (MLE p-value*)									
Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
8-A	July 31	14 (<0.01)	0 (n/a)	0 (n/a)	21 (<0.01)	0 (n/a)	1 (0.09)	0 (n/a)	0 (n/a)	9 (n/a)	45
	August 1	0 (n/a)	0 (n/a)	0 (n/a)	14 (<0.01)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	15
8-B	July 31	599 (<0.01)	24 (<0.01)	2 (1.00)	107 (1.00)	0 (n/a)	2 (1.00)	0 (n/a)	2 (0.40)	8 (n/a)	744
	August 1	216 (<0.01)	8 (<0.01)	14 (<0.01)	136 (<0.01)	0 (n/a)	2 (0.53)	0 (n/a)	1 (0.54)	5 (n/a)	382
9-A	July 31	205 (<0.01)	14 (<0.01)	5 (0.46)	26 (1.00)	0 (n/a)	1 (1.00)	0 (n/a)	2 (0.19)	10 (n/a)	263
	August 1	61 (<0.01)	7 (<0.01)	7 (<0.01)	6 (1.00)	0 (n/a)	2 (0.47)	0 (n/a)	2 (0.07)	2 (n/a)	87
9-B	July 31	24 (<0.01)	5 (<0.01)	2 (0.16)	9 (0.42)	0 (n/a)	2 (0.25)	0 (n/a)	0 (n/a)	3 (n/a)	45
	August 1	19 (<0.01)	5 (<0.01)	7 (<0.01)	18 (<0.01)	0 (n/a)	1 (0.80)	0 (n/a)	1 (0.34)	1 (n/a)	52
10-A	August 14	421 (<0.01)	44 (<0.01)	4 (1.00)	82 (1.00)	0 (n/a)	3 (1.00)	0 (n/a)	0 (n/a)	23 (n/a)	577
	August 15	135 (<0.01)	53 (<0.01)	4 (0.35)	32 (0.61)	3 (1.00)	10 (0.16)	2 (0.17)	1 (1.00)	37 (n/a)	277
	August 16	237 (<0.01)	124 (<0.01)	5 (0.61)	29 (1.00)	2 (1.00)	22 (0.02)	2 (0.23)	5 (0.90)	57 (n/a)	246
10-B	August 14***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	--
	August 15***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	--
	August 16***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	--

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
		Species (MLE p-value*)									
11-A	July 31	56 (<0.01)	18 (<0.01)	10 (<0.01)	20 (0.33)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	14 (n/a)	119
	August 1	35 (<0.01)	15 (<0.01)	9 (<0.01)	16 (0.18)	0 (n/a)	2 (0.85)	0 (n/a)	1 (0.75)	4 (n/a)	82
11-B	July 31	79 (<0.01)	3 (0.03)	0 (n/a)	3 (1.00)	0 (n/a)	2 (0.17)	0 (n/a)	1 (0.23)	2 (n/a)	90
	August 1	67 (<0.01)	4 (<0.01)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	1 (0.03)	0 (n/a)	1 (n/a)	74
12-A	August 5**	1 (0.99)	10 (<0.01)	1 (0.14)	4 (0.03)	0 (n/a)	2 (0.57)	0 (n/a)	0 (n/a)	0 (n/a)	18
	August 6	2 (0.95)	17 (<0.01)	1 (0.23)	7 (<0.01)	0 (n/a)	1 (1.00)	0 (n/a)	2 (0.26)	3 (n/a)	33
	August 7	14 (<0.01)	33 (<0.01)	0 (n/a)	7 (0.16)	0 (n/a)	4 (0.78)	0 (n/a)	1 (0.99)	8 (n/a)	67
12-B	August 5**	7 (0.02)	23 (<0.01)	6 (<0.01)	6 (0.32)	0 (n/a)	6 (0.09)	0 (n/a)	2 (0.41)	4 (n/a)	54
	August 6	10 (<0.01)	14 (<0.01)	1 (0.40)	6 (0.18)	0 (n/a)	4 (0.16)	0 (n/a)	1 (0.72)	3 (n/a)	39
	August 7	21 (<0.01)	19 (<0.01)	2 (0.18)	15 (<0.01)	0 (n/a)	2 (0.96)	0 (n/a)	2 (0.31)	1 (n/a)	41
13-A	August 2**	1 (0.84)	7 (<0.01)	1 (0.10)	2 (0.33)	0 (n/a)	2 (0.38)	0 (n/a)	0 (n/a)	1 (n/a)	14
	August 3	17 (<0.01)	10 (<0.01)	5 (<0.01)	6 (0.84)	1 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	40
	August 4	7 (0.03)	22 (<0.01)	2 (0.04)	8 (0.01)	0 (n/a)	2 (0.99)	0 (n/a)	0 (n/a)	4 (n/a)	45

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	Species (MLE p-value*) EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
13-B	August 2**	2 (0.06)	1 (0.41)	2 (<0.01)	0 (n/a)	0 (n/a)	1 (0.36)	0 (n/a)	1 (0.11)	0 (n/a)	7
	August 3	10 (<0.01)	10 (<0.01)	12 (<0.01)	4 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2 (n/a)	38
	August 4	8 (<0.01)	14 (<0.01)	3 (<0.01)	4 (0.65)	0 (n/a)	2 (0.81)	0 (n/a)	1 (0.72)	4 (n/a)	36
14-A	August 2**	1 (1.00)	46 (<0.01)	4 (<0.01)	4 (0.18)	0 (n/a)	0 (n/a)	0 (n/a)	1 (1.00)	7 (n/a)	63
	August 3	13 (<0.01)	34 (<0.01)	6 (<0.01)	11 (0.04)	0 (n/a)	3 (1.00)	0 (n/a)	7 (<0.01)	7 (n/a)	81
	August 4	34 (<0.01)	40 (<0.01)	0 (n/a)	21 (<0.01)	0 (n/a)	2 (1.00)	0 (n/a)	4 (0.11)	4 (n/a)	105
14-B	August 2	37 (<0.01)	518 (<0.01)	6 (<0.01)	4 (1.00)	0 (n/a)	29 (1.00)	0 (n/a)	31 (<0.01)	60 (n/a)	685
	August 3	24 (0.04)	82 (<0.01)	6 (<0.01)	67 (<0.01)	0 (n/a)	5 (1.00)	0 (n/a)	8 (0.01)	11 (n/a)	203
	August 4	26 (<0.01)	96 (<0.01)	3 (0.11)	37 (<0.01)	0 (n/a)	5 (1.00)	0 (n/a)	8 (0.03)	10 (n/a)	185
15-A	August 2**	5 (0.12)	12 (<0.01)	19 (<0.01)	6 (0.97)	0 (n/a)	2 (0.74)	0 (n/a)	2 (0.16)	3 (n/a)	49
	August 3	10 (0.26)	125 (<0.01)	10 (<0.01)	16 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	42 (<0.01)	25 (n/a)	228
	August 4	10 (0.66)	78 (<0.01)	13 (<0.01)	33 (<0.01)	0 (n/a)	2 (1.00)	0 (n/a)	0 (n/a)	8 (n/a)	144
15-B	August 2	29 (<0.01)	67 (<0.01)	14 (<0.01)	10 (0.93)	0 (n/a)	4 (1.00)	0 (n/a)	5 (0.16)	15 (n/a)	144
	August 3	8 (<0.01)	17 (<0.01)	5 (<0.01)	1 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.79)	7 (n/a)	39
	August 4	14 (<0.01)	60 (<0.01)	4 (<0.01)	10 (0.05)	0 (n/a)	3 (1.00)	0 (n/a)	6 (0.04)	4 (n/a)	101

Table A-3 Species Identification Results - Kaleidoscope

		Species (MLE p-value*)									
Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
16-A	August 2**	11 (1.00)	9 (<0.01)	771 (<0.01)	3 (1.00)	0 (n/a)	2 (0.60)	0 (n/a)	1 (0.75)	12 (n/a)	809
	August 3	8 (1.00)	4 (<0.01)	189 (<0.01)	3 (1.00)	0 (n/a)	1 (0.67)	0 (n/a)	0 (n/a)	3 (n/a)	208
	August 4	5 (1.00)	11 (<0.01)	277 (<0.01)	5 (1.00)	0 (n/a)	3 (0.25)	0 (n/a)	0 (n/a)	14 (n/a)	315
16-B	August 2**	2 (0.33)	6 (<0.01)	1 (0.12)	2 (0.48)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	11
	August 3	8 (<0.01)	10 (<0.01)	6 (<0.01)	3 (1.00)	0 (n/a)	2 (0.57)	0 (n/a)	0 (n/a)	0 (n/a)	29
	August 4	4 (0.17)	29 (<0.01)	11 (<0.01)	2 (1.00)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	1 (n/a)	48
17-A	August 2**	19 (<0.01)	22 (<0.01)	7 (<0.01)	25 (<0.01)	0 (n/a)	2 (0.99)	0 (n/a)	0 (n/a)	0 (n/a)	75
	August 3	6 (0.94)	10 (<0.01)	34 (<0.01)	28 (<0.01)	0 (n/a)	1 (0.98)	0 (n/a)	0 (n/a)	1 (n/a)	80
	August 4	14 (0.07)	13 (<0.01)	14 (<0.01)	38 (<0.01)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	5 (n/a)	85
17-B	August 2**	13 (0.01)	1 (0.56)	14 (<0.01)	26 (<0.01)	0 (n/a)	1 (0.35)	0 (n/a)	1 (0.10)	3 (n/a)	59
	August 3	13 (<0.01)	15 (<0.01)	27 (<0.01)	18 (0.06)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	4 (n/a)	78
	August 4	8 (0.11)	1 (0.18)	18 (<0.01)	18 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	3 (n/a)	48

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
		Species (MLE p-value*)									
23-A	August 10**	8 (0.03)	6 (<0.01)	4 (<0.01)	13 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	32
	August 11**	1 (0.94)	1 (0.10)	0 (n/a)	4 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	7
	August 12**	9 (<0.01)	6 (<0.01)	1 (0.39)	8 (0.02)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.39)	0 (n/a)	25
	August 13	3 (1.00)	6 (<0.01)	1 (0.40)	18 (<0.01)	0 (n/a)	1 (0.82)	0 (n/a)	0 (n/a)	0 (n/a)	29
23-B	August 10**	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0
	August 11**	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0
	August 12**	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0
	August 13	6 (0.01)	0 (n/a)	0 (n/a)	6 (0.03)	0 (n/a)	1 (0.19)	0 (n/a)	1 (0.03)	0 (n/a)	14
24-A	August 2	205 (<0.01)	67 (<0.01)	9 (<0.01)	51 (0.40)	0 (n/a)	5 (1.00)	1 (1.00)	3 (0.89)	13 (n/a)	354
	August 3	200 (<0.01)	38 (<0.01)	7 (0.09)	19 (1.00)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	6 (n/a)	271
	August 4	166 (<0.01)	64 (<0.01)	3 (0.89)	16 (1.00)	0 (n/a)	12 (0.06)	0 (n/a)	1 (1.00)	11 (n/a)	273
24-B	August 2	49 (<0.01)	40 (<0.01)	3 (0.13)	4 (1.00)	0 (n/a)	4 (0.95)	1 (0.22)	4 (0.11)	6 (n/a)	107
	August 3	28 (<0.01)	50 (<0.01)	0 (n/a)	11 (0.18)	0 (n/a)	3 (1.00)	0 (n/a)	1 (1.00)	5 (n/a)	98
	August 4	33 (<0.01)	31 (<0.01)	3 (0.05)	1 (1.00)	0 (n/a)	2 (1.00)	0 (n/a)	4 (0.05)	8 (n/a)	82

Table A-3 Species Identification Results - Kaleidoscope

		Species (MLE p-value*)									
Detector Location	**Survey Date**	**EPFU**	**LABO**	**LACI**	**LANO**	**MYLE**	**MYLU**	**MYSE**	**PESU**	**Unknown**	**Total**
25-A	August 2**	49 (<0.01)	4 (<0.01)	2 (0.41)	9 (1.00)	0 (n/a)	1 (0.74)	0 (n/a)	1 (0.29)	0 (n/a)	66
	August 3	109 (<0.01)	35 (<0.01)	17 (<0.01)	12 (1.00)	0 (n/a)	1 (1.00)	0 (n/a)	4 (0.07)	8 (n/a)	186
	August 4	80 (<0.01)	55 (<0.01)	9 (<0.01)	18 (1.00)	0 (n/a)	5 (0.99)	0 (n/a)	4 (0.25)	7 (n/a)	178
25-B	August 2**	4 (0.11)	3 (<0.01)	5 (<0.01)	5 (0.29)	0 (n/a)	2 (0.13)	0 (n/a)	0 (n/a)	3 (n/a)	22
	August 3	7 (<0.01)	7 (<0.01)	3 (<0.01)	4 (0.58)	0 (n/a)	3 (0.11)	0 (n/a)	0 (n/a)	2 (n/a)	26
	August 4	10 (<0.01)	16 (<0.01)	1 (0.37)	4 (0.61)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	4 (n/a)	36
26-A	August 5**	9 (0.05)	43 (<0.01)	2 (0.09)	13 (<0.01)	0 (n/a)	4 (0.99)	0 (n/a)	4 (0.14)	10 (n/a)	85
	August 6	17 (<0.01)	69 (<0.01)	2 (0.21)	21 (<0.01)	0 (n/a)	7 (0.89)	0 (n/a)	4 (0.42)	17 (n/a)	137
	August 7	37 (<0.01)	149 (<0.01)	4 (0.03)	20 (<0.01)	0 (n/a)	12 (1.00)	2 (0.08)	6 (0.68)	22 (n/a)	252
26-B	August 5**	32 (<0.01)	57 (<0.01)	3 (0.06)	11 (0.42)	0 (n/a)	8 (0.42)	0 (n/a)	2 (0.95)	21 (n/a)	134
	August 6	66 (<0.01)	28 (<0.01)	2 (0.69)	32 (<0.01)	0 (n/a)	4 (0.64)	0 (n/a)	1 (0.97)	8 (n/a)	141
	August 7	63 (<0.01)	20 (<0.01)	3 (0.36)	55 (<0.01)	0 (n/a)	2 (0.96)	0 (n/a)	0 (n/a)	5 (n/a)	148
27-A	August 5**	1 (0.97)	18 (<0.01)	2 (<0.01)	2 (0.47)	0 (n/a)	3 (0.56)	0 (n/a)	0 (n/a)	2 (n/a)	28
	August 6	2 (0.36)	8 (<0.01)	1 (0.12)	2 (0.47)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	13
	August 7	7 (0.01)	13 (<0.01)	1 (0.34)	7 (0.03)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2 (n/a)	30

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
27-B	August 5**	2 (0.79)	41 (<0.01)	0 (n/a)	1 (0.61)	0 (n/a)	3 (1.00)	0 (n/a)	1 (1.00)	6 (n/a)	54
	August 6	3 (0.86)	32 (<0.01)	3 (<0.01)	8 (<0.01)	0 (n/a)	2 (1.00)	0 (n/a)	1 (0.99)	9 (n/a)	58
	August 7	13 (<0.01)	49 (<0.01)	4 (<0.01)	14 (<0.01)	2 (1.00)	2 (1.00)	0 (n/a)	0 (n/a)	21 (n/a)	105
28-A	August 5**	104 (<0.01)	107 (<0.01)	0 (n/a)	28 (0.37)	0 (n/a)	6 (1.00)	0 (n/a)	2 (1.00)	17 (n/a)	264
	August 6	6 (0.52)	38 (<0.01)	1 (0.48)	16 (<0.01)	0 (n/a)	1 (1.00)	0 (n/a)	3 (0.29)	5 (n/a)	70
	August 7	82 (<0.01)	28 (<0.01)	2 (0.82)	36 (<0.01)	0 (n/a)	3 (0.92)	0 (n/a)	1 (0.97)	8 (n/a)	160
28-B	August 5***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 6***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 7***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
29-A	August 5	17 (<0.01)	48 (<0.01)	3 (0.02)	12 (0.02)	0 (n/a)	13 (<0.01)	1 (0.63)	2 (0.87)	12 (n/a)	96
	August 6	17 (<0.01)	24 (<0.01)	6 (<0.01)	17 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.91)	5 (n/a)	65
	August 7	42 (<0.01)	39 (<0.01)	3 (0.13)	24 (<0.01)	0 (n/a)	2 (1.00)	0 (n/a)	2 (0.72)	6 (n/a)	112
29-B	August 5**	39 (<0.01)	21 (<0.01)	1 (0.84)	8 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	4 (n/a)	73
	August 6	14 (<0.01)	9 (<0.01)	4 (<0.01)	16 (<0.01)	0 (n/a)	1 (0.97)	0 (n/a)	1 (0.54)	2 (n/a)	47
	August 7	60 (<0.01)	20 (<0.01)	2 (0.62)	28 (<0.01)	0 (n/a)	1 (1.00)	0 (n/a)	1 (0.85)	2 (n/a)	114

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
30-A	August 5***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 6***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 7***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
30-B	August 5	106 (<0.01)	72 (<0.01)	0 (n/a)	6 (1.00)	0 (n/a)	16 (<0.01)	1 (0.70)	1 (1.00)	12 (n/a)	214
	August 6	57 (<0.01)	34 (<0.01)	2 (0.53)	4 (1.00)	0 (n/a)	6 (0.30)	0 (n/a)	1 (1.00)	4 (n/a)	108
	August 7	113 (<0.01)	34 (<0.01)	1 (1.00)	20 (1.00)	0 (n/a)	5 (0.51)	0 (n/a)	0 (n/a)	3 (n/a)	176
31-A	August 5**	15 (<0.01)	31 (<0.01)	1 (0.50)	4 (0.90)	0 (n/a)	1 (1.00)	0 (n/a)	4 (0.05)	7 (n/a)	63
	August 6	25 (<0.01)	13 (<0.01)	2 (0.19)	11 (0.17)	0 (n/a)	3 (0.40)	0 (n/a)	2 (0.18)	2 (n/a)	58
	August 7	28 (<0.01)	4 (<0.01)	0 (n/a)	8 (0.70)	0 (n/a)	1 (0.68)	0 (n/a)	0 (n/a)	1 (n/a)	42
31-B	August 14	57 (<0.01)	20 (<0.01)	2 (1.00)	191 (<0.01)	0 (n/a)	3 (0.65)	0 (n/a)	1 (0.85)	14 (n/a)	288
	August 15	48 (<0.01)	11 (<0.01)	12 (<0.01)	97 (<0.01)	0 (n/a)	8 (<0.01)	0 (n/a)	0 (n/a)	19 (n/a)	195
	August 16***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
32-A	August 8	13 (<0.01)	80 (<0.01)	2 (0.14)	14 (<0.01)	0 (n/a)	4 (1.00)	0 (n/a)	1 (1.00)	12 (n/a)	126
	August 9***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
32-B	August 8	7 (<0.01)	18 (<0.01)	0 (n/a)	2 (0.90)	0 (n/a)	8 (<0.01)	0 (n/a)	0 (n/a)	10 (n/a)	45
	August 9	13 (<0.01)	39 (<0.01)	0 (n/a)	2 (1.00)	0 (n/a)	4 (0.90)	0 (n/a)	0 (n/a)	12 (n/a)	70
33-A	August 10**	14 (0.61)	15 (<0.01)	200 (<0.01)	14 (1.00)	0 (n/a)	2 (0.87)	0 (n/a)	2 (0.22)	17 (n/a)	264
	August 11**	9 (0.49	6 (<0.01)	84 (<0.01)	28 (0.48)	0 (n/a)	1 (0.86)	0 (n/a)	1 (0.40)	9 (n/a)	138
	August 12**	4 (0.55)	4 (<0.01)	40 (<0.01)	8 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	9 (n/a)	65
	August 13***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
33-B	August 10**	6 (0.80)	3 (<0.01)	87 (<0.01)	4 (1.00)	0 (n/a)	2 (0.13)	0 (n/a)	0 (n/a)	0 (n/a)	102
	August 11**	6 (0.12)	4 (<0.01)	26 (<0.01)	10 (0.69)	1 (1.00)	0 (n/a)	0 (n/a)	2 (0.03)	5 (n/a)	54
	August 12**	5 (0.04)	0 (n/a)	3 (<0.01)	6 (0.09)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	14
	August 13	5 (0.27)	1 (0.27)	31 (<0.01)	10 (0.87)	0 (n/a)	1 (0.28)	0 (n/a)	0 (n/a)	3 (n/a)	51
34-A	August 8	3 (0.73)	3 (0.02)	34 (<0.01)	1 (1.00)	0 (n/a)	1 (0.68)	0 (n/a)	2 (0.02)	0 (n/a)	44
	August 9	4 (1.00)	64 (1.00)	356 (<0.01)	4 (1.00)	0 (n/a)	5 (1.00)	0 (n/a)	1 (1.00)	16 (n/a)	450
34-B	August 8	7 (0.05)	31 (<0.01)	2 (0.05)	8 (0.01)	0 (n/a)	6 (0.28)	0 (n/a)	6 (<0.01)	9 (n/a)	69
	August 9	48 (<0.01)	136 (<0.01)	4 (0.04)	13 (0.69)	0 (n/a)	12 (1.00)	0 (n/a)	39 (<0.01)	42 (n/a)	294

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
		Species (MLE p-value*)									
35-A	August 8	24 (<0.01)	56 (<0.01)	1 (0.73)	10 (0.18)	0 (n/a)	4 (1.00)	0 (n/a)	3 (0.58)	11 (n/a)	109
	August 9	152 (<0.01)	153 (<0.01)	1 (1.00)	25 (1.00)	0 (n/a)	16 (0.82)	1 (1.00)	5 (0.98)	32 (n/a)	385
35-B	August 8	21 (<0.01)	11 (<0.01)	0 (n/a)	4 (1.00)	0 (n/a)	1 (1.00)	0 (n/a)	1 (0.62)	2 (n/a)	40
	August 9	83 (<0.01)	91 (<0.01)	2 (0.79)	12 (1.00)	0 (n/a)	20 (<0.01)	3 (0.06)	4 (0.69)	21 (n/a)	236
38-A	August 10**	14 (<0.01)	9 (<0.01)	8 (<0.01)	9 (0.28)	0 (n/a)	1 (0.97)	0 (n/a)	1 (0.53)	6 (n/a)	48
	August 11***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 12***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 13***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
38-B	August 10	47 (<0.01)	19 (<0.01)	4 (0.07)	52 (<0.01)	0 (n/a)	15 (<0.01)	3 (0.04)	2 (0.33)	19 (n/a)	158
	August 11	35 (<0.01)	23 (<0.01)	4 (0.02)	32 (<0.01)	1 (1.00)	4 (0.72)	13 (<0.01)	2 (0.47)	16 (n/a)	130
	August 12	11 (0.01)	37 (<0.01)	0 (n/a)	15 (<0.01)	0 (n/a)	15 (<0.01)	15 (<0.01)	1 (1.00)	22 (n/a)	105
	August 13 ***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
		Species (MLE p-value*)									
39-A	August 10**	0 (n/a)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1
	August 11**	2 (0.98)	8 (<0.01)	5 (<0.01)	9 (<0.01)	0 (n/a)	3 (0.16)	0 (n/a)	1 (0.50)	10 (n/a)	38
	August 12**	7 (<0.01)	9 (<0.01)	0 (n/a)	2 (0.91)	1 1	2 (0.56)	0 (n/a)	0 (n/a)	6 (n/a)	27
	August 13	2 (0.38)	1 (0.10)	1 (0.13)	3 (0.19)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	8
39-B	August 10**	0 (n/a)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1
	August 11***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 12***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 13***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
41-A	August 10**	3 (0.05)	7 (<0.01)	2 (<0.01)	1 (1.00)	0 (n/a)	1 (0.88)	0 (n/a)	0 (n/a)	1 (n/a)	12
	August 11**	11 (<0.01)	5 (<0.01)	4 (<0.01)	4 (0.91)	0 (n/a)	1 (0.76)	0 (n/a)	0 (n/a)	3 (n/a)	28
	August 12**	14 (<0.01)	5 (<0.01)	1 (0.43)	2 (1.00)	0 (n/a)	1 (0.76)	0 (n/a)	0 (n/a)	2 (n/a)	25
	August 13	20 (<0.01)	10 (<0.01)	0 (n/a)	3 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	33

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	Species (MLE p-value*) EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
41-B	August 10**	11 (<0.01)	12 (<0.01)	3 (<0.01)	2 (1.00)	0 (n/a)	1 (1.00)	0 (n/a)	1 (0.65)	3 (n/a)	33
	August 11**	4 (0.70)	5 (<0.01)	6 (<0.01)	14 (<0.01)	0 (n/a)	5 (<0.01)	0 (n/a)	0 (n/a)	2 (n/a)	36
	August 12**	5 (0.03)	10 (<0.01)	3 (<0.01)	4 (0.40)	0 (n/a)	1 (0.98)	0 (n/a)	0 (n/a)	0 (n/a)	23
	August 13	16 (<0.01)	14 (<0.01)	5 (<0.01)	3 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2 (n/a)	40
42-A	August 2	1101 (<0.01)	69 (<0.01)	1 (1.00)	26 (1.00)	1 (1.00)	39 (<0.01)	1 (1.00)	2 (1.00)	20 (n/a)	1260
	August 3	167 (<0.01)	166 (<0.01)	4 (0.55)	21 (1.00)	1 (1.00)	29 (<0.01)	1 (0.85)	3 (1.00)	51 (n/a)	443
	August 4	185 (<0.01)	144 (<0.01)	155 (<0.01)	17 (1.00)	1 (1.00)	38 (<0.01)	5 (<0.01)	7 (0.45)	62 (n/a)	614
42-B	August 5**	134 (<0.01)	130 (<0.01)	1 (1.00)	34 (0.46)	0 (n/a)	16 (0.45)	0 (n/a)	16 (<0.01)	23 (n/a)	354
	August 6	85 (<0.01)	186 (<0.01)	4 (0.20)	35 (<0.01)	0 (n/a)	15 (1.00)	0 (n/a)	26 (<0.01)	28 (n/a)	379
	August 7	164 (<0.01)	118 (<0.01)	7 (0.03)	53 (<0.01)	0 (n/a)	16 (0.41)	1 (1.00)	5 (0.83)	11 (n/a)	375
43-A	August 14	21 (<0.01)	2 (0.01)	0 (n/a)	9 (0.20)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	3 (n/a)	35
	August 15	32 (<0.01)	91 (<0.01)	7 (<0.01)	6 (1.00)	0 (n/a)	4 (1.00)	0 (n/a)	5 (0.37)	26 (n/a)	171
	August 16**	20 (<0.01)	25 (<0.01)	4 (<0.01)	16 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	5 (<0.01)	6 (n/a)	76
43-B	August 17**	13 (<0.01)	13 (<0.01)	0 (n/a)	10 (0.01)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	37
	August 18**	4 (0.07)	4 (<0.01)	1 (0.20)	4 (0.16)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	5 (n/a)	18

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
44-A	August 8	276 (<0.01)	16 (<0.01)	0 (n/a)	13 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	20 (n/a)	325
	August 9	349 (<0.01)	45 (<0.01)	1 (1.00)	5 (1.00)	0 (n/a)	3 (1.00)	0 (n/a)	2 (0.81)	18 (n/a)	423
44-B	August 8	3 (1.00)	48 (<0.01)	17 (<0.01)	13 (0.02)	0 (n/a)	1 (1.00	0 (n/a)	0 (n/a)	24 (n/a)	106
	August 9	7 (<0.01)	11 (<0.01)	7 (<0.01)	4 (0.88)	0 (n/a)	1 (1.00)	0 (n/a)	1 (0.62)	3 (n/a)	34
45-A	August 8	2 (0.76)	2 (<0.01)	5 (<0.01)	6 (0.07)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2 (n/a)	17
	August 9	1 (1.00)	6 (<0.01)	57 (<0.01)	4 (1.00)	0 (n/a)	1 (0.82)	0 (n/a)	0 (n/a)	2 (n/a)	71
45-B	August 8	13 (<0.01)	7 (<0.01)	6 (<0.01)	19 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	1 (0.43)	3 (n/a)	49
	August 9	65 (<0.01)	7 (<0.01)	4 (0.05)	14 (1.00)	0 (n/a)	2 (0.47)	0 (n/a)	2 (0.07)	5 (n/a)	99
47-A	August 8	12 (0.02)	47 (<0.01)	2 (0.14)	19 (<0.01)	1 (1.00)	8 (0.22)	0 (n/a)	1 (1.00)	25 (n/a)	115
	August 9	39 (<0.01)	107 (<0.01)	2 (0.38)	21 (<0.01)	1 (1.00)	20 (0.02)	1 (0.71)	9 (0.03)	50 (n/a)	250
47-B	August 8	45 (<0.01)	6 (<0.01)	1 (0.90)	11 (0.87)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2 (n/a)	65
	August 9	31 (<0.01)	2 (0.03)	2 (0.28)	19 (<0.01)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	3 (n/a)	57
48-A	August 8	18 (<0.01)	50 (<0.01)	0 (n/a)	9 (0.09)	0 (n/a)	8 (0.29)	0 (n/a)	3 (0.50)	22 (n/a)	110
	August 9	16 (<0.01)	63 (<0.01)	1 (0.57)	5 (0.69)	0 (n/a)	7 (0.73)	0 (n/a)	0 (n/a)	16 (n/a)	108

Table A-3 Species Identification Results - Kaleidoscope

		Species (MLE p-value*)									
Detector Location	**Survey Date**	**EPFU**	**LABO**	**LACI**	**LANO**	**MYLE**	**MYLU**	**MYSE**	**PESU**	**Unknown**	**Total**
48-B	August 8	21 (<0.01)	50 (<0.01)	0 (n/a)	11 (0.04)	0 (n/a)	3 (1.00)	1 (0.17)	1 (1.00)	11 (n/a)	98
	August 9	68 (<0.01)	76 (<0.01)	2 (0.66)	7 (1.00)	0 (n/a)	9 (0.60)	1 (0.43)	4 (0.51)	23 (n/a)	190
49-A	August 14	88 (<0.01)	26 (<0.01)	4 (0.39)	114 (<0.01)	0 (n/a)	7 (0.07)	1 (0.76)	2 (0.57)	21 (n/a)	263
	August 15	119 (<0.01)	99 (<0.01)	9 (<0.01)	36 (0.07)	0 (n/a)	17 (0.07)	1 (1.00)	7 (0.17)	51 (n/a)	339
	August 16	101 (<0.01)	18 (<0.01)	0 (n/a)	64 (<0.01)	0 (n/a)	7 (<0.01)	1 (0.41)	0 (n/a)	22 (n/a)	213
49-B	August 14	23 (<0.01)	35 (<0.01)	10 (<0.01)	11 (0.42)	0 (n/a)	5 (0.59)	0 (n/a)	3 (0.26)	5 (n/a)	92
	August 15	29 (<0.01)	90 (<0.01)	1 (0.79)	4 (1.00)	1 (1.00)	7 (1.00)	0 (n/a)	3 (0.95)	29 (n/a)	164
	August 16	23 (<0.01)	46 (<0.01)	0 (n/a)	3 (1.00)	1 (1.00)	3 (1.00)	1 (0.16)	0 (n/a)	20 (n/a)	97
52-A	August 14	23 (<0.01)	35 (<0.01)	10 (<0.01)	11 (0.42)	0 (n/a)	5 (0.59)	0 (n/a)	3 (0.26)	5 (n/a)	92
	August 15	29 (<0.01)	90 (<0.01)	1 (0.79)	4 (1.00)	1 (1.00)	7 (1.00)	0 (n/a)	3 (0.95)	29 (n/a)	164
	August 16	23 (<0.01)	46 (<0.01)	0 (n/a)	3 (1.00)	1 (1.00)	3 (1.00)	1 (0.16)	0 (n/a)	20 (n/a)	97
52-B	August 14	26 (<0.01)	10 (<0.01)	1 (0.74)	14 (0.03)	0 (n/a)	3 (0.24)	1 (0.21)	1 (0.58)	2 (n/a)	58
	August 15	19 (<0.01)	25 (<0.01)	0 (n/a)	12 (0.01)	0 (n/a)	4 (0.50)	0 (n/a)	0 (n/a)	8 (n/a)	68
	August 16**	17 (<0.01)	24 (<0.01)	1 (0.62)	13 (<0.01)	0 (n/a)	2 (1.00)	0 (n/a)	4 (0.02)	7 (n/a)	68

Table A-3 Species Identification Results - Kaleidoscope

		Species (MLE p-value*)									
Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
53-A	August 8	11 (0.02)	13 (<0.01)	28 (<0.01)	18 (0.05)	0 (n/a)	4 (0.13)	0 (n/a)	1 (0.69)	11 (n/a)	86
	August 9	32 (<0.01)	42 (<0.01)	4 (<0.01)	9 (0.83)	0 (n/a)	5 (0.73)	0 (n/a)	0 (n/a)	9 (n/a)	101
53-B	August 8	25 (<0.01)	10 (<0.01)	1 (0.66)	5 (1.00)	0 (n/a)	3 (0.24)	1 (0.21)	1 (0.58)	11 (n/a)	57
	August 9	8 (<0.01)	16 (<0.01)	3 (<0.01)	4 (0.64)	0 (n/a)	5 (0.07)	1 (0.32)	1 (0.78)	1 (n/a)	39
54-A	August 10**	0 (<0.01)	0 (<0.01)	1 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1
	August 11**	12 (<0.01)	7 (<0.01)	2 (0.06)	6 (0.35)	0 (n/a)	1 (0.88)	0 (n/a)	0 (n/a)	1 (n/a)	29
	August 12**	4 (0.34)	19 (<0.01)	1 (0.29)	7 (<0.01)	0 (n/a)	3 (0.60)	0 (n/a)	0 (n/a)	3 (n/a)	37
	August 13	7 (0.01)	28 (n/a)	6 (<0.01)	5 (0.53)	0 (n/a)	2 (1.00)	0 (n/a)	1 (0.97)	6 (n/a)	55
54-B	August 10**	0 (n/a)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1
	August 11**	9 (<0.01)	10 (<0.01)	4 (<0.01)	7 (0.16)	0 (n/a)	2 (0.57)	0 (n/a)	0 (n/a)	2 (n/a)	34
	August 12**	6 (0.12)	2 (0.04)	2 (0.04)	12 (<0.01)	0 (n/a)	1 (0.43)	0 (n/a)	0 (n/a)	3 (n/a)	26
	August 13	4 (0.80)	20 (<0.01)	2 (0.05)	14 (<0.01)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	2 (n/a)	43

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	Species (MLE p-value*)									
		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
56-A	August 10**	0 (n/a)	0 (n/a)	1 (1.00)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1
	August 11**	20 (<0.01)	14 (<0.01)	3 (0.03)	15 (<0.01)	0 (n/a)	2 (0.81)	0 (n/a)	1 (0.72)	10 (n/a)	65
	August 12**	5 (0.49)	51 (<0.01)	1 (0.41)	9 (<0.01)	0 (n/a)	13 (<0.01)	0 (n/a)	0 (n/a)	7 (n/a)	86
	August 13	7 (<0.01)	10 (<0.01)	0 (n/a)	4 (0.28)	0 (n/a)	1 (0.98)	0 (n/a)	0 (n/a)	3 (n/a)	25
56-B	August 11**	3 (0.34)	0 (n/a)	2 (0.01)	6 (0.02)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2 (n/a)	13
	August 12**	1 (0.58)	3 (<0.01)	1 (0.07)	1 (0.80)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	1 (n/a)	7
	August 13	7 (<0.01)	4 (<0.01)	1 (0.31)	6 (0.07)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	2 (n/a)	20
57-A	August 10**	8 (<0.01)	0 (n/a)	1 (0.27)	2 (0.99)	0 (n/a)	1 (0.19)	0 (n/a)	1 (0.03)	0 (n/a)	13
	August 11**	5 (0.40)	4 (<0.01)	2 (0.05)	14 (<0.01)	0 (n/a)	1 (0.66)	0 (n/a)	0 (n/a)	0 (n/a)	26
	August 12**	3 (0.11)	0 (n/a)	0 (n/a)	3 (0.18)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	6
	August 13	5 (<0.01)	4 (<0.01)	0 (n/a)	2 (0.73)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	11

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
		Species (MLE p-value*)									
57-B	August 10**	2 (0.72)	7 (<0.01)	3 (<0.01)	5 (0.07)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	4 (n/a)	21
	August 11**	9 (<0.01)	3 (0.02)	3 (<0.01)	10 (<0.01)	0 (n/a)	2 (0.16)	0 (n/a)	1 (0.24)	2 (n/a)	30
	August 12**	2 (0.69)	14 (<0.01)	1 (0.17)	4 (0.5)	0 (n/a)	0 (n/a)	0 (n/a)	5 (<0.01)	5 (n/a)	31
	August 13	9 (<0.01)	4 (<0.01)	1 (0.31)	3 (0.84)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	0 (n/a)	17
58-A	August 14	159 (<0.01)	41 (<0.01)	3 (0.92)	67 (<0.01)	0 (n/a)	9 (0.05)	3 (<0.01)	0 (n/a)	37 (n/a)	319
	August 15	66 (<0.01)	78 (<0.01)	8 (<0.01)	22 (0.28)	0 (n/a)	13 (0.08)	0 (n/a)	0 (n/a)	54 (n/a)	241
	August 16	121 (<0.01)	149 (<0.01)	5 (0.13)	28 (0.84)	5 (1.00)	10 (1.00)	6 (<0.01)	0 (n/a)	82 (n/a)	406
58-B	August 14	304 (<0.01)	76 (<0.01)	117 (<0.01)	92 (0.95)	1 (1.00)	17 (<0.01)	2 (0.98)	4 (0.77)	36 (n/a)	649
	August 15	128 (<0.01)	153 (<0.01)	12 (<0.01)	39 (0.04)	1 (1.00)	18 (0.58)	2 (0.13)	6 (0.86)	39 (n/a)	398
	August 16	217 (<0.01)	195 (<0.01)	42 (<0.01)	36 (1.00)	2 (1.00)	13 (1.00)	1 (0.58)	5 (1.00)	53 (n/a)	564
59-A	August 5**	4 (0.04)	4 (<0.01)	4 (<0.01)	3 (0.74)	0 (n/a)	2 (0.18)	0 (n/a)	0 (n/a)	2 (n/a)	19
	August 6	30 (<0.01)	11 (<0.01)	5 (<0.01)	42 (<0.01)	0 (n/a)	4 (0.09)	0 (n/a)	1 (0.62)	5 (n/a)	98
	August 7	22 (<0.01)	17 (<0.01)	0 (n/a)	49 (<0.01)	1 (1.00)	3 (0.58)	0 (n/a)	1 (0.80)	12 (n/a)	105

Table A-3 Species Identification Results - Kaleidoscope

Detector Location	Survey Date	Species (MLE p-value*) EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
59-B	August 5**	4 (0.03)	11 (<0.01)	1 (0.19)	2 (0.73)	0 (n/a)	4 (0.08)	0 (n/a)	0 (n/a)	0 (n/a)	18
	August 6***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 7***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
60-A	August 17***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 18***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
60-B	August 14	101 (<0.01)	5 (<0.01)	0 (n/a)	41 (<0.01)	0 (n/a)	2 0.2671592	0 (n/a)	0 (n/a)	10 (n/a)	159
	August 15	58 (<0.01)	18 (<0.01)	8 (<0.01)	18 (0.56)	0 (n/a)	1 (1.00)	1 (0.08)	2 (0.28)	8 (n/a)	114
	August 16**	61 (<0.01)	25 (<0.01)	1 (1.00)	47 (<0.01)	0 (n/a)	3 (0.85)	0 (n/a)	1 (0.94)	17 (n/a)	155
61-A	August 14***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 15***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 16***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0

Table A-3 Species Identification Results - Kaleidoscope

		Species (MLE p-value*)									
Detector Location	Survey Date	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	PESU	Unknown	Total
61-B	August 14	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 15***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 16***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
61-C	August 17***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	August 18***	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	-- (n/a)	0
	Total Bat Passes	**11,642**	**8,371**	**3,658**	**4,209**	**36**	**1,023**	**79**	**463**	**2,331**	**31,812**

Note: A successful night is defined as a night when weather conditions met the USFWS Guidelines and/or a call was identified as a northern long-eared bat in either or both programs.

* Maximum Likelihood Estimate based on Britzke et al. 2002. A p-value less than 0.05 indicate statistical significance support for presence. P-values are presented to the nearest hundredth. P-values the program identified as 0.00 are presented in the table as <0.01. P-values the program identified as 0.99 or greater are presented in the table as 1.00.

** Unsuccessful acoustic night due to wind and/or rain during the survey period

*** Unsuccessful acoustic night due to detector malfunction.

Key:

EPFU = Big brown bat MYLE = Eastern small-footed bat

LABO = Eastern red bat MYLU = Little brown bat

LACI = Hoary bat MYSE = Northern long-eared bat

LANO = Silver-haired bat PESU = Tri-colored bat

B

Résumés of Biologists Performing Acoustic Analysis

EDUCATION

M.S., Biology, magna cum laude, Missouri State University

B.S., Biology, Central Missouri State University

A.A.S., State Fair Community College

CERTIFICATIONS

USFWS-Permitted Biologist for Indiana Bat, Gray Bat, Ozark Big-Eared Bat, and Virginia Big-Eared Bat

WAFWA-approved Technical Service Provider for Lesser Prairie-Chicken Surveys

Mr. Flinn specializes in evaluating the interaction between wind energy facilities and the environment, particularly their impact to and associated risks regarding regional bat and bird populations. Through 2015, under E & E's Federal Fish and Wildlife Permit granted by USFWS, he is authorized to capture, handle, radio-tag, and release the Indiana bat, gray bat, Ozark big-eared bat, and Virginia big-eared bat in the Midwestern and Northeastern United States as part of Endangered Species Act Section 7 consultation.

Having conducted specialized bat investigations in 23 states, Mr. Flinn is adept in species identification and the use of survey methods including mist net capture, radio tracking, and acoustic monitoring with the AnaBat and Wildlife Acoustic systems. He is thoroughly familiar with the limitations and pitfalls of acoustic monitoring projects; has managed and interpreted numerous project bat call files; and has developed methods to streamline acoustic surveys, reduce data processing times, and provide strong data QC. With E & E, Mr. Flinn developed a standard operating procedure for acoustic bat monitoring and mist netting. In addition, he applies geographic information system (GIS) technology for habitat delineation, resource mapping, animal movement/home range analysis, and predictive modeling.

Wind Energy Projects

Wind Energy Farms, Eight States. For a major wind energy developer, Mr. Flinn has conducted bat surveys and monitoring, data downloads and analysis, and equipment troubleshooting at proposed wind energy sites in Missouri, Michigan, Kansas, Nebraska, Arkansas, Indiana, Illinois, and Iowa. He has installed acoustic bat detectors on meteorological towers and provided training for the client tower crews to perform detector data card swaps. For example, for a 150-MW wind farm site in Missouri, he contributed to E & E's constraints analysis, provided permitting support, participated in summer bat mist-netting surveys and passive acoustic detection during the spring and fall migratory periods, then used the survey results to help identify presence/absence of the federally endangered Indiana bat and to document overall bat activity and habitat use. In addition, Mr. Flinn provided acoustic bat survey data management; contributed to the final report summarizing two years of bat survey projects and the habitat conservation plan, which was needed to obtain an incidental take permit for the Indiana bat; and developed a predictive GIS map of potential future bat activity over the entire project area.

For the same client, for a potential wind energy site in Nebraska, he coordinated the installation of 12 acoustic bat detectors on six meteorological towers; trained the client's tower crews assigned to perform AnaBat detector data card swaps; oversaw the acoustic monitoring; and was responsible for data downloads, analysis, equipment troubleshooting, and data QC. Mr. Flinn installed acoustic bat detectors on meteorological towers at two proposed wind energy sites in Arkansas, analyzed and interpreted the recorded data, and provided data management. At one Arkansas site, he led the bat mist-netting survey team. He also surveyed 10 sites for presence/absence of three federally endangered species (Indiana bat, Ozark big-eared bat, and gray bat). For proposed wind farms in Illinois, he provided maintenance and troubleshooting for bat detectors installed on meteorological towers, then coordinated the data downloads and analyses. In addition, he completed surveys for migratory raptors, conducted prairie chicken listening surveys, and identified leks at two sites in Oklahoma.

Wind Energy Site, Queen City, Missouri. For a confidential client, Mr. Flinn was a member of E & E's team of specialists that identified potential wind energy project impacts on bats and developed a survey protocol to determine the presence or absence of federally endangered Indiana bats. He installed passive ground-based acoustic monitoring stations located in favorable Indiana bat habitat and oversaw the subcontractor conducting the acoustic monitoring and bat netting. When Indiana bats were identified and radio-tracked to local roost sites, Mr. Flinn helped develop a predictive bat activity map to aid in the design of a turbine layout that would minimize risks to bats. He consulted with involved agencies and worked with the subcontractor to develop a habitat conservation plan for the project.

Black Fork Wind Farm, Crawford and Richland Counties, Ohio. As a member of the E & E team conducting a constraints analysis and providing permitting support for this 200-MW wind farm, Mr. Flinn set up and operated passive acoustic bat monitors on three meteorological towers and reviewed the recorded acoustic bat call data to identify the presence/absence of the federally endangered Indiana bat along with other bat species. He led the bat mist-netting team that surveyed 23 sites to determine presence/absence of federally endangered Indiana bat, provided data management and analysis, and prepared the survey report. In addition, he helped prepare the bat section of the project application submitted to Ohio Power Siting Board. For this project, Mr. Flinn also was a member of the E & E team that conducted raptor stick nest surveys. When the site was acquired by a different company, he completed the acoustic analysis and report for submission to the Ohio Power Siting Board and provided additional consultation with the state and federal agencies on behalf of the new owner.

Walker Ridge Wind Energy Site, Lake and Colusa Counties, California. Responsible for providing technical support and troubleshooting for E & E's bat detector surveys for AltaGas, he compiled and analyzed acoustic data obtained from AnaBat monitors on the three meteorological towers, contributed to the feasibility study addressing potential bat risks, and wrote the acoustic bat survey report. When the project was expanded to include detectors on two more towers, Mr. Flinn provided QC for data collection, management, and analysis; made the final identifications for the echolocation data; and helped guide the report writing efforts.

Bat Acoustical Monitoring Workshop, Missouri. In 2009, Mr. Flinn developed and taught a workshop on bat acoustical monitoring. The workshop focused on the proper survey techniques for AnaBat SD1 detectors and the analysis of call/echolocation data. It covered field setup, data collection and organization, Analook software applications, call analysis, call interpretation to identify species or species group, and trouble shooting.

Wind Power Development Sites, Northern Missouri. As a graduate research specialist with Missouri State University, Mr. Flinn provided data management for several acoustic monitoring projects at wind energy sites. To determine the presence or absence of the federally endangered Indiana bat at five different development sites in northern Missouri, he completed mist-net and acoustic surveys, radio-tracked Indiana bats to roost sites, and wrote reports describing the roosting and foraging areas. To investigate preconstruction bat activity and identify associated project constraints at three proposed wind power facilities, he analyzed over 18 months of acoustic data recorded from over 100 detector sites yielding nearly 1 million AnaBat files, in order to develop a predictive map of bat activity.

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Flinn, J.R., 2009, Winter Roosting Behavior of Red Bats (*Lasiurus borealis*): Habitat Use, Microclimate, and the Effects of Ambient Temperature on Roost Choice, master's thesis, Springfield, Missouri, Missouri State University.

EDUCATION

B.S., Environmental Science, Canisius College

CERTIFICATIONS

Permitted Biologist for Indiana and Gray Bat, USFWS

Qualified Bat Surveyor, USFWS Pennsylvania Field Office

JUSTIN A. ZOLADZ — Ecologist

With 14 years' experience, Mr. Zoladz conducts aquatic and terrestrial vegetation and wildlife investigations to support E & E's preparation of EAs, EISs, and ERs for existing and proposed pipeline facilities, wind energy facilities, military installations, and other commercial development sites. He performs wetland delineations; habitat evaluations; threatened and endangered (T/E) species surveys including bat, raptor, prairie chicken, and eagle surveys; environmental regulatory compliance evaluations; and sampling of sediment, surface water, soil, and groundwater. Since 2012, Mr. Zoladz has been a federally permitted biologist authorized to capture, handle, band, radio-tag, and release the Indiana bat and gray bat under E & E's Federal Fish and Wildlife Permit in the midwestern and northeastern United States as part of Endangered Species Act Section 7 consultation. While working under other permitted biologists since 2009, he has conducted bat surveys using mist-net capture, radio telemetry, and AnaBat acoustic monitoring techniques. Mr. Zoladz utilizes GPS and geographic information system (GIS) technology to support wetland and habitat delineations and resource mapping projects.

Survival, Evasion, Resistance, and Escape (SERE) East Surveys, Navy SERE School, Redington, Maine. Under E & E's National Environmental Policy Act (NEPA) contract with the United States Naval Facilities Engineering Command Atlantic Division (NAVFAC Atlantic), NAVY SERE School East, Franklin County, Maine. Mr. Zoladz was one of the field leads to conduct an acoustic monitoring presence/absence survey for the then federally threatened northern long-eared bat in accordance with the United States Fish and Wildlife Service (USFWS) guidelines. He was responsible for detector deployment, data management, and was a member of the E & E team to conduct qualitative species-level detection evaluation. The surveys are in support of the Missile Defense Agency (MDA) exploration of additional locations in the United States suitable for future deployment of ballistic missiles and to aid in determining potential environmental impacts resulting from future deployment of the Continental United States Interceptor Site. The MDA is preparing this EIS to evaluate the potential environmental impacts that could result from the future deployment of the Continental United States Interceptor Site (CIS).

Ripley-Westfield Wind Farm, Chautauqua County, New York. As E & E's lead biologist for this proposed 125-MW wind power project of Pattern Renewables Development Co., Mr. Zoladz has completed wetland delineations, raptor and eagle surveys, and nighttime bat surveys using AnaBat monitoring devices. He prepared sections of the report on wetlands and bodies of surface water to support the draft EIS (DEIS), then wrote responses to comments on the draft EIS as part of final EIS development. He conducted on-site visits with agency personnel from the New York State Department of Agriculture and Markets to address layout concerns , then worked closely with the developer's engineering firm to modify the project layout design to minimize impacts on wetlands and bodies of surface water, making specific design changes in response to DEIS comments.

Commercial Wind Projects, New York and Ohio. Mr. Zoladz installed AnaBat detectors on meteorological towers at two wind energy sites to support a confidential client with project permitting. He helped document the presence/absence of bat species in each project area during the spring and fall migratory periods, as well as during the summer months; compiled bat echolocation data; and contributed to the bat baseline study reports.

Black Fork Wind Farm, Crawford and Richland Counties, Ohio. As a member of the E & E team that completed a constraint analysis and provided permitting support for this 200-MW wind farm, Mr. Zoladz conducted wetland delineations and was member of the bat mist-netting team that surveyed 23 sites to determine presence/absence of the federally listed endangered Indiana bat. Mr. Zoladz was one of the permitted bat biologists and led the field teams to re-survey 19 sites within the new the project area for the federally listed endangered Indiana bat and federally listed threatened northern long-eared bat.

Wind Energy Farms, Arkansas, Kansas, Oklahoma, and Missouri. For a major wind energy developer, Mr. Zoladz conducted wetland delineations, bat surveys, raptor, and prairie chicken surveys in these three states. Mr.

Zoladz was part of the E & E bat mist-netting survey team at one Arkansas project site surveying 10 sites to determine the presence/absence of three federally listed endangered species: Indiana bat, gray bat, and Ozark big-eared bat. For this confidential client, he also participated in bat mist-netting surveys at eight locations at a wind site in in Nodaway County, Missouri, to investigate the presence or absence of Indiana bats.

Proposed Wind Energy Project, Delaware and Randolph Counties, Indiana. He performed preconstruction bat mist-netting surveys to investigate presence/absence of Indiana bat, conducted radio telemetry studies to identify roost trees, and compiled emergence counts.

Additional Wind Projects, Ohio. Mr. Zoladz was a member of E & E teams conducting mist net surveys for three clients' wind projects in Hardin, Ashtabula, Seneca, Hancock, and Crawford Counties. Working under the supervision of USFWS-approved Indiana bat biologists, he completed mist-net surveys at over 50 locations to determine the presence/absence of Indiana bats and contributed to the final reports. For the Seneca, Hancock, and Crawford County projects, he conducted radio telemetry studies that included identification of roosts and performance of emergence counts. For the Ashtabula site, he installed AnaBat detectors on a meteorological tower, provided technical support for subsequent acoustical bat surveys involving use of the tower-mounted detectors, conducted the acoustic call analyses and species identification, and contributed to the final report. He has also conducted nighttime owl surveys at the Ashtabula site.

Northern Pass Transmission Line Third-Party EIS, Quebec, Canada to Deerfield, New Hampshire. Mr. Zoladz conducted a bat acoustic survey over the proposed 187-mile high-voltage direct current (HVDC) transmission line anticipated to deliver hydropower from Quebec to southern New Hampshire. He conducted the survey using AnaBat acoustic detectors, specifically targeting the northern long-eared bat, a species currently proposed as endangered by the USFWS. In consultation with USFWS, Mr. Zoladz assisted in developing the survey protocol, because a recovery plan and survey guidance had not yet been developed at the time.

Additional Bat Surveys, Shannon County, Missouri. In autumn 2011, Mr. Zoladz volunteered with Missouri State University graduate students to investigate federally listed endangered Indiana and gray bats within the Ozark National Scenic Riverways. He identified and collected data for about 180 bats, including 27 gray bats and seven Indiana bats.

Cave/Mine Surveys, Erie County, New York. In the winter of 2011, 2012, and 2014, Mr. Zoladz joined NYSDEC biologists as a volunteer to support a state-wide, winter hibernaculum survey to document the effects of bat white nose syndrome.

KATIE M. BAKER — Ecologist

EDUCATION

M.S., Biology, Missouri State University

B.S., Marine Biology and Environmental Studies, cum laude, University of North Carolina at Wilmington

CERTIFICATIONS

Permitted Biologist for Indiana, Gray, Ozark Big-Eared, and Virginia Big-Eared Bat, USFWS

Qualified Indiana Bat Surveyor, USFWS Pennsylvania Field Office

Ms. Baker has nine years' experience, specializing in the evaluation of bats and other wildlife. She conducts biological surveys and contributes to E & E's preparation of critical feature assessments; permit applications; and EAs, EISs, and ERs for existing and proposed gas and electric transmission projects, wind and solar energy sites, and military operations. A USFWS-approved Indiana bat surveyor, she is qualified to survey and identify all U.S. bat species as part of Endangered Species Act Section 7 consultation. Her experience includes the performance of bat mist-netting, acoustic, and abandoned mine surveys. In addition, she has conducted wetland delineation, winter tracking, small mammal, prairie-chicken, and sage grouse surveys.

Under E & E's USFWS threatened and endangered permit, Ms. Baker is authorized to capture, handle, radio-tag, and release the Indiana bat, gray bat, Ozark big-eared bat, and Virginia big-eared bat in the United States as part of Endangered Species Act Section 7 consultation. Since 2008, she has managed and conducted mist-netting surveys in 10 US states, identifying and documenting thousands of bats, including the Indiana bat and gray bat (federally listed endangered species), the northern long-eared bat (federally listed threatened species), and eastern small-footed bat (a state-listed endangered species). She has performed bat mist-netting surveys, harp-trapping surveys, hibernacula surveys, abandoned mine surveys, bat acoustic monitoring, and radio-telemetry of bats and Allegheny woodrats. She has placed survey nets at over 500 sites—including one in Nicaragua—supervising and training survey team members. Ms. Baker applies the results of her investigations to evaluate project impacts and associated risks related to regional bat populations.

Bat Mist-Netting. Ms. Baker has conducted bat mist-netting surveys in six US states and in Nicaragua to evaluate the presence/probable absence of endangered bat species at proposed energy project sites. Survey components include onsite reconnaissance of forested areas for potential mist-net sites, assembly and set-up of mist-net equipment, capture and identification of bats in the mist nets, set-up of bat acoustic monitoring equipment, and supervision of employees during surveys. When endangered bat species are captured during surveys, Ms. Baker conducts radio-telemetry to locate roosts and exit counts. She follows survey protocol of the USFWS and guidance specific to each state. Ms. Baker is responsible for the synthesis of bat acoustic and mist-netting data and report preparation after completion of a survey. For confidential clients, she recently conducted bat mist-netting surveys at sites in the following locations:

- **Ohio: Allen, Ashtabula, Auglaize, Crawford, Hardin, Hancock, Richland, and Seneca Counties;**
- **Indiana: Delaware and Randolph Counties;**
- **Illinois: DeWitt and Macon Counties;**
- **Maine: Franklin County;**
- **Missouri: Nodaway County; and**
- **Tennessee: Shelby County.**

Bat Acoustical Monitoring. Ms. Baker has conducted pre-construction bat acoustic monitoring surveys in 10 states to assess bat activity, timing, and composition at proposed wind energy sites. Experience includes assembly of monitoring equipment on project metrological towers, extraction of data from storage cards, analysis of acoustic data to identify bat calls and arrange them by species or species group, report preparation, and QC review of data analysis procedures and results. Representative wind energy sites include:

- **Ohio: Hardin, Hancock, Seneca, Crawford, and Ashtabula Counties;**
- **Indiana: Clinton, Delaware, and Randolph Counties;**
- **Illinois: DeWitt and Macon Counties, Illinois;**
- **Missouri: Nodaway County;**
- **Iowa: Poweshiek County;**
- **Michigan: Gratiot County;**
- **Nebraska: Dixon County;**
- **Oklahoma: Osage and Washita Counties;**
- **Kansas: Clark and Scott Counties; and**
- **California: Tres Vaqueros Wind Energy Project in Contra Costa County and Walker Ridge Wind Energy Site in Lake and Colusa Counties.**

Wind Energy Farms, Illinois and Indiana. Ms. Baker helped analyze recorded bat echolocation calls to identify bat activity trends and species group composition, then wrote the bat acoustic reports for a confidential client's proposed wind farms in Macon/DeWitt Counties, Illinois; and Delaware/Randolph Counties, Indiana. For both sites, she also completed preconstruction mist-netting surveys for Indiana bat.

Proposed Wind Projects, Five Midwestern States. As part of E & E's spring, summer, and autumn preconstruction bat acoustical monitoring surveys for a major wind energy developer, Ms. Baker filtered and identified bat acoustic calls for proposed wind farm projects in Michigan, Missouri, Nebraska, Illinois, and Iowa. As part of site reconnaissance-level surveys at 11 sites to identify possible locations for bat mist netting, she drove and walked around the project areas to find and photograph forested habitat blocks that were adequate for net placement, then delineated the potential mist-netting locations using GPS equipment.

Chisholm View Wind Project, Garfield and Grant Counties, Oklahoma. Ms. Baker led the post-construction fatality study at a wind project in Garfield and Grant Counties, Oklahoma. Duties included training and supervision of seasonal employees performing standardized carcass searches, identification and data collection on all discovered carcasses, conducting searcher efficiency and carcass persistence trials throughout the survey, and training of operations and maintenance staff on reporting procedures. After completion of the survey, Ms. Baker analyzed data to calculate a fall fatality estimate and prepared the fall interim report.

Criterion Wind Project, Garrett County, Maryland. For this 70-MW wind project sponsored by Exelon Corporation (formerly Constellation Energy), Ms. Baker assisted in writing the bat sections of E & E's EA addressing potential environmental impacts resulting from the proposed issuance of an incidental take permit and its associated habitat conservation plan for the Indiana bat.

BIBLIOGRAPHY:

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Day, K.D., 2008, Effects of Temperature on Winter Energetics of Female Indiana bats (*Myotis sodalis*), master's thesis, Missouri State University at Springfield.

C Detector Location Photographs

Site 1-A (Canopy; facing north-northeast)

Site 1-A (Cone of Detection; facing north-northeast)

Site 1-A (Overview; facing south-southwest)

Site 1-B (Canopy; facing east)

Site 1-B (Cone of Detection; facing east)

Site 1-B (Overview; facing west)

Site 2-A (Canopy; facing south)

Site 2-A (Cone of Detection; facing south)

Site 2-A (Overview; facing north)

Site 2-B (Canopy; facing south-southwest)

Site 2-B (Cone of Detection; facing south-southwest)

Site 2-B (Overview; facing north-northeast)

Site 3-A (Canopy; facing east-northeast)

Site 3-A (Cone of Detection; facing east-northeast)

Site 3-A (Overview; west-southwest)

Site 3-B (Canopy; facing east)

Site 3-B (Cone of Detection; facing east)

Site 3-B (Overview; facing west)

Site 4-A (Canopy; facing southeast)

Site 4-A (Cone of Detection; facing southeast)

Site 4-A (Overview; facing northwest)

Site 4-B (Canopy; facing west)

Site 4-B (Cone of Detection; facing west)

Site 4-B (Overview; facing east)

Site 5-A (Canopy; facing south-southwest)

Site 5-A (Cone of Detection; facing south-southwest)

Site 5-A (Overview; facing north-northeast)

Site 5-B (Canopy; facing northwest)

Site 5-B (Cone of Detection; facing northwest)

Site 5-B (Overview; facing southeast)

Site 6-A (Canopy; facing north)

Site 6-A (Cone of Detection; facing north)

Site 6-A (Overview; facing south)

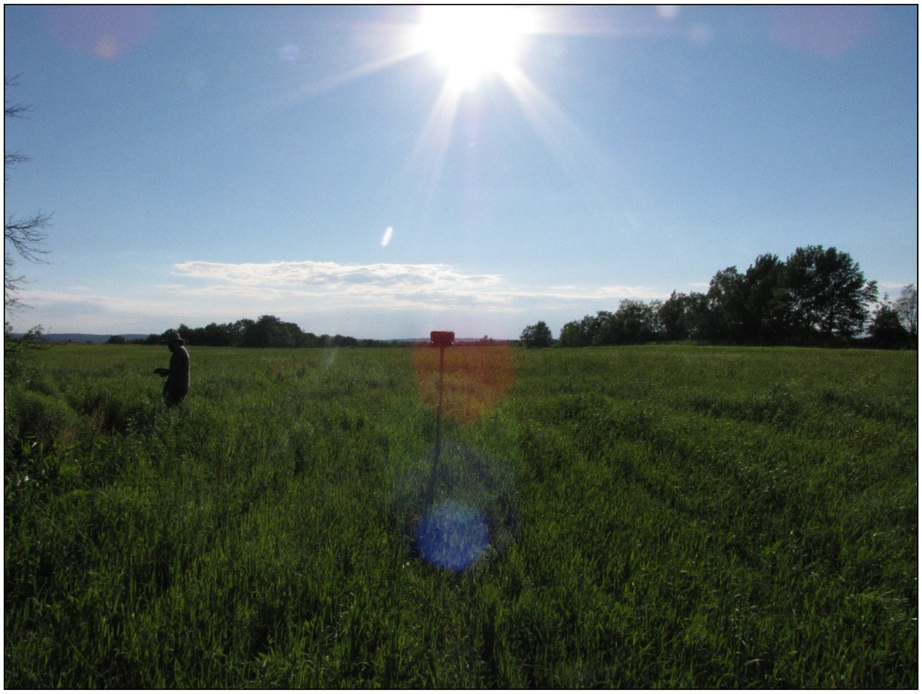
Site 6-B (Canopy; facing east)

Site 6-B (Cone of Detection; facing east)

Site 6-B (Overview; facing west)

Site 7-A (Canopy; facing east)

Site 7-A (Cone of Detection; facing east)



Site 7-A (Overview; facing west)

Site 7-B (Canopy; facing south-southwest)

Site 7-B (Cone of Detection; facing south-southwest)

Site 7-B (Overview; facing north-northeast)

Site 8-A (Canopy; facing west-northwest)

Site 8-A (Cone of Detection; facing west-northwest)

Site 8-A (Overview; facing east-southeast)

Site 8-B (Canopy; facing southeast)

Site 8-B (Cone of Detection; facing southeast)

Site 8-B (Overview; facing northwest)

Site 9-A (Canopy; facing east)

Site 9-A (Cone of Detection; facing east)

Site 9-A (Overview; facing west)

Site 9-B (Canopy; facing west)

Site 9-B (Cone of Detection; facing west)

Site 9-B (Overview; facing east)

Site 10-A (Canopy; facing east-northeast)

Site 10-A (Cone of Detection; facing east-northeast)

Site 10-A (Overview; facing west-southwest)

Site 10-B (Canopy; facing southwest)

Site 10-B (Cone of Detection; facing southwest)

Site 10-B (Overview; facing northeast)


Site 11-A (Canopy; facing southwest)


Site 11-A (Cone of Detection; facing southwest)


Site 11-A (Overview; facing northeast)


Site 11-B (Canopy; facing east)

Site 11-B (Cone of Detection; facing east)

Site 11-B (Overview; facing west)

Site 12-A (Canopy; facing northeast)

Site 12-A (Cone of Detection; facing northeast)

Site 12-A (Overview; facing southwest)

Site 12-B (Canopy; facing southeast)

Site 12-B (Cone of Detection; facing southeast)

Site 12-B (Overview; facing northwest)

Site 13-A (Canopy; facing west)

Site 13-A (Cone of Detection; facing west)

Site 13-A (Overview; facing east)

Site 13-B (Canopy; facing southwest)

Site 13-B (Cone of Detection; facing southwest)

Site 13-B (Overview; facing northeast)

Site 14-A (Canopy; facing south-southeast)

Site 14-A (Cone of Detection; facing south-southeast)

Site 14-A (Overview; facing north-northwest)

Site 14-B (Canopy; facing southeast)

Site 14-B (Cone of Detection; facing southeast)

Site 14-B (Overview; facing northwest)

Site 15-A (Canopy; facing south)

Site 15-A (Cone of Detection; facing south)

Site 15-A (Overview; facing north)

Site 15-B (Canopy; facing northeast)

Site 15-B (Cone of Detection; facing northeast)

Site 15-B (Overview; facing southwest)

Site 16-A (Canopy; facing northwest)

Site 16-A (Cone of Detection; facing northwest)

Site 16-A (Overview; facing southeast)

Site 16-B (Canopy; facing southwest)

Site 16-B (Cone of Detection; facing southwest)

Site 16-B (Overview; facing northeast)

Site 17-A (Canopy; facing south)

Site 17-A (Cone of Detection; facing south)

Site 17-A (Overview; facing north)

Site 17-B (Canopy; facing northwest)

Site 17-B (Cone of Detection; facing northwest)

Site 17-B (Overview; facing southeast)

Site 23-A (Canopy; facing east-northeast)

Site 23-A (Cone of Detection; facing east-northeast)

Site 23-A (Overview; facing west-southwest)

Site 23-B (Canopy; facing southeast)

Site 23-B (Cone of Detection; facing southeast)

Site 23-B (Overview; facing northwest)

Site 24-A (Canopy; facing east)

Site 24-A (Cone of Detection; facing east)

Site 24-A (Overview; facing west)

Site 24-B (Canopy; facing northeast)

Site 24-B (Cone of Detection; facing northeast)

Site 24-B (Overview; facing southwest)

Site 25-A (Canopy; facing east)

Site 25-A (Cone of Detection; facing east)

Site 25-A (Overview; facing west)

Site 25-B (Canopy; facing northeast)

Site 25-B (Cone of Detection; facing northeast)

Site 25-B (Overview; facing southwest)

Site 26-A (Canopy; facing north-northwest)

Site 26-A (Cone of Detection; facing north-northwest)

Site 26-A (Overview; facing south-southeast)

Site 26-B (Canopy; facing south-southeast)

Site 26-B (Cone of Detection; facing south-southeast)

Site 26-B (Overview; facing north-northwest

Site 27-A (Canopy; facing southeast)

Site 27-A (Cone of Detection; facing southeast)

Site 27-A (Overview; facing northwest)

Site 27-B (Canopy; facing south)

Site 27-B (Cone of Detection; facing south)

Site 27-B (Overview; facing north)

Site 28-A (Canopy; facing west)

Site 28-A (Cone of Detection; facing west)

Site 28-A (Overview; facing east)

Site 28-B (Canopy; facing west)

Site 28-B (Cone of Detection; facing west)

Site 28-B (Overview; facing east)

Site 29-A (Canopy; facing south-southwest)

Site 29-A (Cone of Detection; facing south-southwest)

Site 29-A (Overview; facing north-northeast)

Site 29-B (Canopy; facing southwest)

Site 29-B (Cone of Detection; facing southwest)

Site 29-B (Overview; facing northeast)

Site 30-A (Canopy; facing east-southeast)

Site 30-A (Cone of Detection; facing east-southeast)

Site 30-A (Overview; facing west-northwest)

Site 30-B (Canopy; facing southeast)

Site 30-B (Cone of Detection; facing southeast)

Site 30-B (Overview; facing northwest)

Site 31-A (Canopy; facing southeast)

Site 31-A (Cone of Detection; facing southeast)

Site 31-A (Overview; facing northwest)

Site 31-B (Canopy; facing east)

Site 31-B (Cone of Detection; facing east)

Site 31-B (Overview; facing west)

Site 32-A (Canopy; facing east)

Site 32-A (Cone of Detection; facing east)

Site 32-A (Overview; facing west)

Site 32-B (Canopy; facing northeast)

Site 32-B (Cone of Detection; facing northeast)

Site 32-B (Overview; facing southwest)

Site 33-A (Canopy; facing west-northwest)

Site 33-A (Cone of Detection; facing west-northwest)

Site 33-A (Overview; facing east-southeast)

Site 33-B (Canopy; facing east)

Site 33-B (Cone of Detection; facing east)

Site 33-B (Overview; facing west)

Site 34-A (Canopy; facing east)

Site 34-A (Cone of Detection; facing east)

Site 34-A (Overview; facing west)

Site 34-B (Canopy; facing northeast)

Site 34-B (Cone of Detection; facing northeast)

Site 34-B (Overview; facing southwest)

Site 35-A (Canopy; facing west)

Site 35-A (Cone of Detection; facing west)

Site 35-A (Overview; facing east)

Site 35-B (Canopy; facing south)

Site 35-B (Cone of Detection; facing south)

Site 35-B (Overview; facing north)

Site 38-A (Canopy; facing southeast)

Site 38-A (Cone of Detection; facing southeast)

Site 38-A (Overview; facing northwest)

Site 38-B (Canopy; facing west-southwest)


Site 38-B (Cone of Detection; facing west-southwest)


Site 38-B (Overview; facing east-northeast)


Site 39-A (Canopy; facing west)


Site 39-A (Cone of Detection; facing west)

Site 39-A (Overview; facing east)

Site 39-B (Canopy; facing northeast)

Site 39-B (Cone of Detection; facing northeast)

Site 39-B (Overview; facing southwest)


Site 41-A (Canopy; facing south-southeast)


Site 41-A (Cone of Detection; facing south-southeast)

Site 41-A (Overview; facing north-northwest)

Site 41-B (Canopy; facing northeast)

Site 41-B (Cone of Detection; facing northeast)

Site 41-B (Overview; facing southwest)

Site 42-A (Canopy; facing west)

Site 42-A (Cone of Detection; facing west)

Site 42-A (Overview; facing east)

Site 42-B (Canopy; facing northeast)

Site 42-B (Cone of Detection; facing northeast)

Site 42-B (Overview; facing southwest)

Site 43-A (Canopy; facing north-northwest)

Site 43-A (Cone of Detection; facing north-northwest)

Site 43-A (Overview; facing south-southeast)

Site 43-B (Canopy; facing southwest)

Site 43-B (Cone of Detection; facing southwest)

Site 43-B (Overview; facing northeast)

Site 44-A (Canopy; facing southeast)

Site 44-A (Cone of Detection; facing southeast)

Site 44-A (Overview; facing northwest)

Site 44-B (Canopy; facing west-northwest)

Site 44-B (Cone of Detection; facing west-northwest)

Site 44-B (Overview; facing east-southeast)

Site 45-A (Canopy; facing southeast)

Site 45-A (Cone of Detection; facing southeast)

Site 45-A (Overview; facing northwest)

Site 45-B (Canopy; facing south)

Site 45-B (Cone of Detection; facing south)

Site 45-B (Overview; facing north)

Site 47-A (Canopy; facing east)

Site 47-A (Cone of Detection; facing east)

Site 47-A (Overview; facing west)

Site 47-B (Canopy; facing northeast)

Site 47-B (Cone of Detection; facing northeast)

Site 47-B (Overview; facing southwest)

Site 48-A (Canopy; facing northwest)

Site 48-A (Cone of Detection; facing northwest)

Site 48-A (Overview; facing southeast)

Site 48-B (Canopy; facing west)

Site 48-B (Cone of Detection; facing west)

Site 48-B (Overview; facing east)

Site 49-A (Canopy; facing west)

Site 49-A (Cone of Detection; facing west)

Site 49-A (Overview; facing east)

Site 49-B (Canopy; facing north-northwest)

Site 49-B (Cone of Detection; facing north-northwest)

Site 49-B (Overview; facing south-southeast)

Site 52-A (Canopy; facing north-northwest)

Site 52-A (Cone of Detection; facing north-northwest)

Site 52-A (Overview; facing south-southeast)

Site 52-B (Canopy; facing south)

Site 52-B (Cone of Detection; facing south)

Site 52-B (Overview; facing north)

Site 53-A (Canopy; facing northwest)

Site 53-A (Cone of Detection; facing northwest)

Site 53-A (Overview; facing southeast)

Site 53-B (Canopy; facing southwest)

Site 53-B (Cone of Detection; facing southwest)

Site 53-B (Overview; facing northeast)

Site 54-A (Canopy; facing northeast)

Site 54-A (Cone of Detection; facing northeast)

Site 54-A (Overview; facing southwest)

Site 54-B (Canopy; facing south-southeast)

Site 54-B (Cone of Detection; facing south-southeast)

Site 54-B (Overview; facing north-northwest)

Site 56-A (Canopy; facing west-northwest)

Site 56-A (Cone of Detection; facing west-northwest)

Site 56-A (Overview; facing east-southeast)

Site 56-B (Canopy; facing east)

Site 56-B (Cone of Detection; facing east)

Site 56-B (Overview; facing west)

Site 57-A (Canopy; facing southwest)

Site 57-A (Cone of Detection; facing southwest)

Site 57-A (Overview; facing northeast)

Site 57-B (Canopy; facing west)

Site 57-B (Cone of Detection; facing west)

Site 57-B (Overview; facing east)

Site 58-A (Canopy; facing south-southwest)

Site 58-A (Cone of Detection; facing south-southwest)

Site 58-A (Overview; facing north-northeast)

Site 58-B (Canopy; facing north-northeast)

Site 58-B (Cone of Detection; facing north-northeast)

Site 58-B (Overview; facing south-southwest)

Site 59-A (Canopy; facing southwest)

Site 59-A (Cone of Detection; facing southwest)

Site 59-A (Overview; facing northeast)

Site 59-B (Canopy; facing north)

Site 59-B (Cone of Detection; facing north)

Site 59-B (Overview; facing south)

Site 60-A (Canopy; facing west)

Site 60-A (Cone of Detection; facing west)

Site 60-A (Overview; facing east)

Site 60-B (Canopy; facing north-northeast)

Site 60-B (Cone of Detection; facing north-northeast)

Site 60-B (Overview; facing south-southwest)

Site 61-A (Canopy; facing west-northwest)

Site 61-A (Cone of Detection; facing west-northwest)

Site 61-A (Overview; facing east-southeast)

Site 61-B (Canopy; facing southeast)

Site 61-B (Cone of Detection; facing southeast)

Site 61-B (Overview; facing northwest)


Site 61-C (Canopy; facing west)


Site 61-C (Cone of Detection; facing west)

Site 61-C (Overview; facing east)