DICKINSON WRIGHT PLLC

150 E. GAY STREET, 24TH FLOOR
COLUMBUS, OH 43215-3192
TELEPHONE: (614) 591-5461
FACSIMILE: (844) 670-6009
http://www.dickinsonwright.com

CHRISTINE M.T. PIRIK
CPirik@dickinsonwright.com

August 14, 2018

Ms. Barcy F. McNeal, Secretary
Ohio Power Siting Board
Docketing Division
180 East Broad Street, 11th Floor
Columbus, Ohio 43215-3793

Re: Case No. 18-91-EL-BGN

In the Matter of the Application of Paulding Wind Farm IV LLC for a Certificate of Environmental Compatibility and Public Need to Construct a Wind-Powered Electric Generation Facility in Paulding County, Ohio.

Second Supplement to Application – Update to Exhibit R, Bat Acoustic Survey

Dear Ms. McNeal:

On July 2, 2018, as supplemented on July 27, 2018, Paulding Wind Farm IV LLC ("Applicant") filed an application with the Ohio Power Siting Board ("Board") for a certificate of public convenience and necessity ("Application") to construct a wind-powered electric generation facility in Paulding County, Ohio.

As Exhibit R to its Application, the Applicant filed a Bat Acoustic Survey dated May – November 16, 2017. At this time, the Applicant is filing the attached updated Bat Acoustic Survey Final Report dated May 4, 2017 – July 15, 2018, which replaces and supersedes Exhibit R filed with the Application on July 2, 2017.

The original of this Second Supplement to the Application was filed electronically. In addition, 20 complete paper copies of the have been provided to the Docketing Division.

We are available, at your convenience, to answer any questions you may have.

Respectfully submitted,

/s/ *Christine M.T. Pirik*
Christine M.T. Pirik (0029759)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
Dickinson Wright PLLC
150 East Gay Street, Suite 2400
Columbus, Ohio 43215
Phone: (614) 591-5461
Email: cpirik@dickinsonwright.com
todonnell@dickinsonwright.com
wvorys@dickinsonwright.com

Attorneys for Paulding Wind Farm IV LLC

Enclosure
Cc: Grant Zeto

CERTIFICATE OF SERVICE

The Ohio Power Siting Board's e-filing system will electronically serve notice of the filing of this document on the parties referenced in the service list of the docket card who have electronically subscribed to these cases. In addition, the undersigned certifies that a copy of the foregoing document is also being served upon the persons below this 14th day of August, 2018.

/s/ Christine M.T. Pirik
Christine M.T. Pirik (0029759)

Counsel:

thomas.lindgren@ohioattorneygeneral.gov

Administrative Law Judges:

jay.agranoff@puco.ohio.gov

COLUMBUS 56242-8 95423v1

Bat Acoustic Survey for the Timber Road IV Wind Farm Paulding County, Ohio

Final Report

May 4, 2017 – July 15, 2018

Prepared for:

EDP Renewables North America, LLC

808 Travis Street, Suite 700
Houston, Texas 77002

Prepared by:

Goniela Iskali and Ashley Matteson

Western EcoSystems Technology, Inc.
408 W. 6th St.
Bloomington, Indiana 47401

August 13, 2018

EXECUTIVE SUMMARY

Western EcoSystems Technology, Inc. initiated a bat acoustic survey for the proposed Timber Road IV Wind Farm (TRIV) in Paulding County, Ohio, in 2017 and 2018. The bat acoustic surveys that were conducted exceeded recommendations of the Ohio Department of Natural Resources (ODNR) *On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio*. ODNR protocol recommends that acoustic bat surveys be conducted from March 15 – November 15 at all project meteorological (met) towers with one detector raised at five meters (m; 16 feet [ft]) and one detector raised at 45 m (148 ft).

Surveys at the TRIV were conducted at the only met tower, located in agricultural fields from May 4 – November 15, 2017, and March 14 – July 15, 2018, using AnaBat™ SD2 detectors. One detector was placed approximately one m (three ft) from the ground from May 4 to July 14, 2017, at the location of the met tower before the met tower was erected. When the met tower was constructed on July 15, 2017, three detectors were deployed in total, with microphones raised to five m (16 ft), 45 m (148 ft), and 80 m (263 ft). Acoustic monitoring was conducted with the three raised microphones from July 15 to November 15, 2017, and from March 14 to July 15, 2018, in order to complete one year of acoustic monitoring in accordance with the ODNR protocol. The detector at 80 m exceeded ODNR recommendations, and was added to better estimate levels of bat activity within the rotor-swept zone based on the size of the turbines proposed for TRIV. All bat calls recorded were classified to species or species group by comparing qualitative and quantitative call characteristics to a known call library by a qualified bat biologist.

A total of 1,918 bat passes were analyzed by acoustic bat experts from acoustic data recorded from May 4, 2017, to July 15, 2018. The majority (51.1%; 980 bat passes) of bat passes were classified as big brown/silver-haired bats, followed by eastern red bats (16.9%; 324 bat passes), and hoary bats (11.8%; 227 bat passes). No *Myotis* species bat passes were identified.

AnaBat detectors placed at the met tower from July 16, 2017, to July 15, 2018, recorded 1,626 bat passes during 705 detector-nights. Overall AnaBat detectors recorded a combined mean (± standard error) of 2.27 ± 0.20 bat passes per detector-night. The 5-m detector recorded an average bat pass rate of 4.24 ± 0.48 bat passes per detector-night. The 45-m detector recorded an average bats pass of 1.42 ± 0.14 bat passes per detector-night, and the 80-m detector recorded an average bats pass of 1.15 ± 0.13 bat passes per detector-night.

Bat activity at the met tower varied substantially between seasons, with lowest activity in the spring, intermediate activity in summer, and highest activity in the fall. Bat activity rates peaked in mid-August, largely driven by the presence of big brown/silver-haired bat group bat passes. Higher activity during the late summer and early fall may be due to the presence of migrating bats or to the combined presence of both post-lactating females and newly volant juveniles, and is consistent with the timing of bat activity recorded at other wind projects in Ohio and the Midwest.

STUDY PARTICIPANTS

Western EcoSystems Technology

Goniela Iskali	Project Manager
Ashley Matteson	Bat Call Identifier, Data Analyst, Report Writer
Kevin Murray	Bat Call Identifier and Senior Reviewer
Karl DuBridge	Field Supervisor
Lacey Jeroue	Statistician
Jeff Fruhwirth	GIS Technician
Katie Wynne	Technical Editing Coordinator
Andrea Palochak	Technical Editor
Kyle Proxmire	Field Technician

REPORT REFERENCE

Iskali, G. and A. Matteson. 2018. Bat Acoustic Survey for the Timber Road IV Wind Farm, Paulding County, Ohio. Final Report: May 4, 2017 – July 15, 2018. Prepared for EDP Renewables North America, LLC., Houston, Texas. Prepared by Western EcoSystems Technology, Inc. (WEST), Bloomington Indiana. July 26, 2018.17 pp.

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INTRODUCTION

EDP Renewables North America, LLC (EDPR) is proposing development of the Timber Road IV Wind Farm (TRIV or Project), in Paulding County, Ohio. EDPR contracted Western EcoSystems Technology, Inc. (WEST) to complete a study of bat activity that exceeded the recommendations of the Ohio Department of Natural Resources' (ODNR) Wind and Wildlife *On-Shore Bird and Bat Pre- and Post-Construction Protocol for Commercial Wind Energy Facilities in Ohio* (ODNR 2009). WEST conducted acoustic monitoring surveys to estimate levels of bat activity throughout the TRIV between May 4, 2017, and July 15, 2018. The first objective of this report was to summarize use and species composition and explore spatial and temporal variation for the data recorded from July 16, 2017, to July 15, 2018 when all raised microphones were deployed. The reason for this primary objective was to summarize a full year of data when microphones were raised at the met tower, as per the ODNR protocol (ODNR 2009). The second objective of this report was to summarize all of the data and species composition recorded for the entire duration of monitoring at TRIV from May 4, 2017, to July 15, 2018. The reason for this second objective was to provide a comprehensive look at all the data collected during bat acoustic surveys at the TRIV.

STUDY AREA

The Project area is approximately 30,868.9 acres (12,492.2 hectares). Cultivated crops and developed areas are the two most dominant land cover types, totaling 97.2% of the overall TRIV according to the National Land Cover Database (NLCD; US Geological Survey [USGS] NLCD 2011, Homer et al. 2015). Developed areas are generally confined to roads, residences, and farms scattered throughout the Project area. The remaining Project area is composed of deciduous forest, herbaceous lands, open water, hay/pasture, and wetlands that each account for less than 1.0% of the total land cover (Table 1, Figure 1).

Table 1. Land cover within 1.0 kilometer (0.6 mile) of the Timber Road IV Wind Farm's proposed turbines.

Land Cover Type	Acres	% Composition
Cultivated Crops	28,235.4	91.5
Developed, Open Space	1,368.8	4.4
Developed, Low Intensity	328.7	1.1
Woody Wetlands	288.2	0.9
Deciduous Forest	271.7	0.9
Herbaceous	208.7	0.7
Open Water	46.7	0.2
Hay/Pasture	38.3	0.1
Developed, Medium Intensity	33.0	0.1
Emergent Herbaceous Wetlands	31.5	0.1
Developed, High Intensity	18.0	0.1
Total*	**30,868.9**	**100**

Data from US Geological Survey National Land Cover Database 2011, Homer et al. 2015.

Sums may not equal totals shown due to rounding.

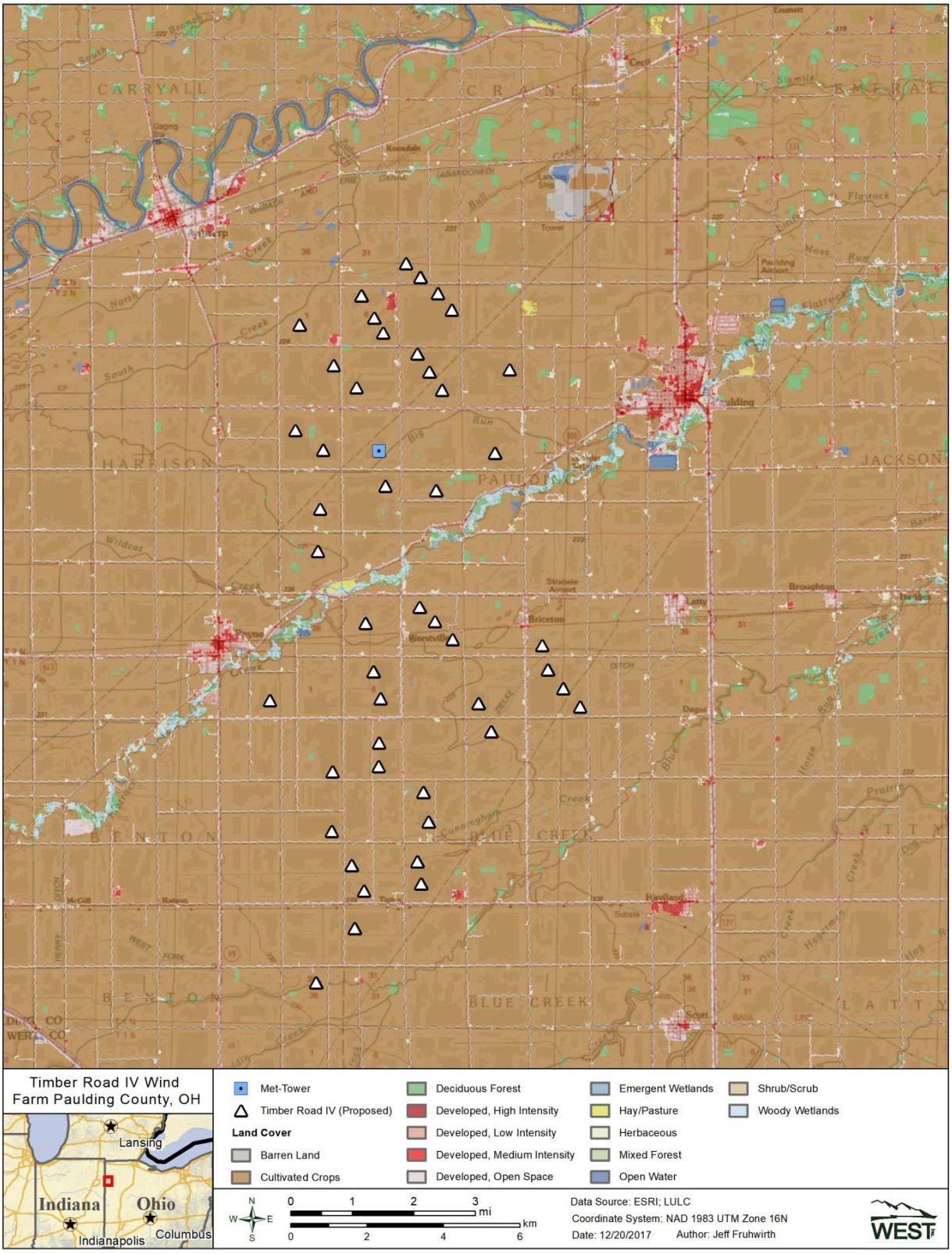

Figure 1. Land cover in the Timber Road IV Wind Farm and location of the meteorological tower and proposed turbines (US Geological Survey National Land Cover Database 2011, Homer et al. 2015).

Overview of Bat Diversity

The Project occurs within the range of 10 species of bats. Two of these bats are federal- and state-listed endangered or threatened species. The Indiana bat (*Myotis sodalis*) is a federal- and state-listed endangered species and the northern long-eared bat (*Myotis septentrionalis*) is a federal- and state-listed threatened species. Presence/absence mist-net surveys conducted during the summer of 2017 did not capture any Indiana or northern long-eared bats, and therefore presence of these bats during the summer is considered unlikely (Iskali and Bishop-Boros 2017). The remaining bats, with the exception of the Seminole bat *(Lasiurus seminolus*) are listed as Ohio Species of Concern or Species of Interest (ODNR 2017).

Table 2. Bat species with potential to occur within the Timber Road IV Wind Farm (Brack et al. 2010) categorized by echolocation call frequency.

Common Name	Scientific Name
High-Frequency (> 30 kHz)	
eastern red bat[1, 2]	*Lasiurus borealis*
little brown bat[1]	*Myotis lucifugus*
northern long-eared bat[1, 3]	*Myotis septentrionalis*
Indiana bat[1, 4]	*Myotis sodalis*
evening bat[1]	*Nycticeius humeralis*
tri-colored bat[1]	*Perimyotis subflavus*
Seminole bat[1]	*Lasiurus seminolus*
Low-Frequency (< 30 kHz)	
big brown bat[1]	*Eptesicus fuscus*
hoary bat[1, 2]	*Lasiurus cinereus*
silver-haired bat[1, 2]	*Lasionycteris noctivagans*

[1] species known to have been killed at wind energy facilities (species reported as fatalities by Kunz et al. 2007b, Hale and Karsten 2010, Good et al. 2011);

[2] long-distance migrant

[3] federal- and state listed threatened species (USFWS 2015); and

[4] federal- and state listed endangered species (USFWS 1967, 2007).

METHODS

Bat Acoustic Surveys

Three AnaBat™ SD2 ultrasonic bat detectors (Titley Scientific™, Columbia, Missouri) were used during the study at the Project's only meteorological (met) tower. The ground detector was placed approximately one meter (m; three feet [ft]) from the ground from May 4 to July 14, 2017, before the met tower was constructed. Once the met tower was available on July 15, 2017, three detectors were used in total, with microphones raised at five m (16 ft; ground detector), 45 m (148 ft; raised detector), and 80 m (263 ft; raised detector). The three raised detectors monitored data from July 15 to November 15, 2017 and from March 14 to July 15, 2018. The detector at 80 m exceeded ODNR protocol and was used to better estimate levels of bat activity within the rotor-swept zone based on the size of the turbines proposed to be used at the TRIV. Species activity levels and composition can vary with altitude (Baerwald and Barclay 2009, Collins and Jones 2009, Müeller et al. 2013). Therefore, it can be useful to monitor activity at

different heights (Kunz et al. 2007a). Ground-based microphones likely detect a more complete sample of the bat species present within the Project area, whereas raised microphones may give a more accurate assessment of risk to bat species flying at rotor swept heights (Kunz et al. 2007a, Müeller et al. 2013; but see Amorim et al. 2012). The met tower was located in cropland, which is representative of the proposed turbine locations.

Each AnaBat unit was placed inside a plastic weather-tight container that had a hole cut in the side through which the microphone extended. Each microphone was encased in a 45-degree angle poly-vinyl chloride (PVC) tube, and holes were drilled in the PVC tube to allow water to drain. Microphones, encased in weatherproofing, were elevated at fixed heights on the met tower.

AnaBat units were calibrated and sensitivity levels were set to six (Larson and Hayes 2000) to standardize acoustic sampling effort across the Project, a level that balanced the goal of recording bat calls against the need to reduce interference from other sources of ultrasonic noise (Brooks and Ford 2005). Detectors were programmed to turn on approximately 30 minutes (min) before sunset and turn off approximately 30 min after sunrise each night. Detectors were checked weekly to ensure that they were functioning properly, and to change batteries and data cards.

Call Analysis

AnaBat detectors used a broadband high-frequency (HF) microphone to detect the echolocation calls of bats. Incoming echolocation calls were digitally processed and stored on a high-capacity compact flash card. The resulting files were viewed in appropriate software (e.g., AnaLook©) as digital sonograms that showed changes in echolocation call frequency over time. Frequency versus time displays were used to separate bat calls from other types of ultrasonic noise (e.g., wind, insects) and to determine the call frequency category and (when possible) the species of bat that generated the calls.

Bat passes were sorted into two groups based on their minimum frequency for each survey location. The HF bats, such as eastern red bats (*Lasiurus borealis*), evening bats (*Nycticeius humeralis*), and *Myotis* species, have minimum call frequencies greater than 30 kilohertz (kHz). The low-frequency (LF) bats, such as big brown bats (*Eptesicus fuscus*), silver-haired bats (*Lasionycteris noctivagans*), and hoary bats (*Lasiurus cinereus*), typically emit echolocation calls with minimum frequencies below 30 kHz. The HF and LF species that may occur in the study area are listed in Table 2.

Bat calls were classified to species or species group by comparing qualitative and quantitative call characteristics to a known call library (O'Farrell et al. 1999, Murray et al. 2001, Yates and Muzika 2006). Call characteristics such as minimum frequency, slope, and structure were used to identify calls. Bat calls were assigned to individual species or one of four bat species groups: 1) big brown bat/silver-haired bat, 2) eastern red bat/evening bat, 3) eastern red bat/tri-colored bat (*Perimyotis subflavus*), or 4) *Myotis* species. Calls that could not be assigned to one of these species groups were classified as unknown.

Statistical Analysis

The number of bat passes per detector-night was used as an index of bat activity in the Project area. A bat pass was defined as a sequence of at least two echolocation calls (pulses) produced by an individual bat with no pause between calls of more than one second (Fenton 1980). A detector-night was defined as one detector operating for one entire night. The terms bat pass and bat call are used interchangeably. Bat passes per detector-night was calculated for all bats, and for HF and LF bats. Bat pass rates represent indices of bat activity and do not represent numbers of individuals. The number of bat passes was determined by an experienced bat biologist using AnaLook.

Periods of high bat activity were defined as the 7-day period with the highest average bat activity. If multiple 7-day periods equaled the peak sustained bat activity rate, all dates in these 7-day periods were reported. This and all multi-detector averages in this report were calculated as an unweighted average of total activity at each detector. To highlight seasonal activity patterns, the analysis was divided into three survey periods: spring (March 14 – May 15), summer (May 16 – July 15), and fall (July 16 – November 15).

Two analyses were conducted on the data. The first analysis was done to summarize the data recorded from July 16, 2017, to July 15, 2018 when the met tower was up and the microphones were raised at the 5-m, 45-m, and 80-m microphone height. This data incorporated all of the data that was collected to meet ODNR recommendations for acoustic monitoring. The second analysis was done to summarize all of the species recorded for the entire duration of monitoring at TRIV and incorporated all data recorded from May 4, 2017, to July 15, 2018, from before and after the met tower was erected and the microphones were raised. This second analysis provided a comprehensive look of the species recorded during all acoustic bat monitoring surveys at the TRIV.

RESULTS

Bat Acoustic Surveys from July 16, 2017, to July 15, 2018

A total of 1,626 total bat passes were recorded during 705 detector-nights from July 16, 2017, to July 15, 2018, with three AnaBat detectors with microphones placed at 5-m, 45-m, and 80-m heights. AnaBat units operated for 95.1% of the sampling period. The primary cause of lost data was battery and detector failure.

Elevational Variation

The 5-m microphone recorded 1,027 bat passes (63.2% of all bat passes) on 242 detector-nights for a mean (± standard error) of 4.24 ± 0.45 bat passes per detector-night. The 45-m microphone recorded 343 bat passes (21.1% of all bat passes) on 241 detector nights for a mean of 1.42 ± 0.14 bat passes per detector-night, and the 80-m microphone recorded 256 bat passes (15.7% of all bat passes) on 222 detector nights for a mean of 1.15 ± 0.13 bat passes per detector-night (Table 3).

Across all microphone heights, LF bat activity was greater than HF bat activity, with 1,331 LF bat passes recorded and 295 HF bat passes recorded. The 5-m microphone recorded 71.2% of all HF bat passes (n=210) and 61.4% of all LF bat passes (n=817). The 45-m microphone recorded 20.0% of all HF bat passes (n=59) and 21.3% of all LF bat passes (n=284). The 80-m microphone recorded 8.8% of all HF bat passes (n=26) and 17.3% of all LF bat passes (n=230; Table 3, Figure 2).

Table 3. Results of acoustic bat surveys conducted at the meteorological tower within the Timber Road IV Wind Farm from July 16, 2017 – July 15, 2018. Passes are separated by call frequency: high frequency (HF) and low frequency (LF).

AnaBat Station	Location	# of HF Bat Passes	# of LF Bat Passes	Total Bat Passes	Detector-Nights	Bat Passes/ Night*
TR4-5m	ground	210	817	1,027	242	4.24±0.48
TR4-45m	raised	59	284	343	241	1.42±0.14
TR4-80m	raised	26	230	256	222	1.15±0.13
Total Ground		**210**	**817**	**1,027**	**242**	**4.24±0.45**
Total Raised		**85**	**514**	**599**	**463**	**1.29±0.12**
Total		**295**	**1,331**	**1,626**	**705**	**2.27±0.20**

*± bootstrapped standard error.

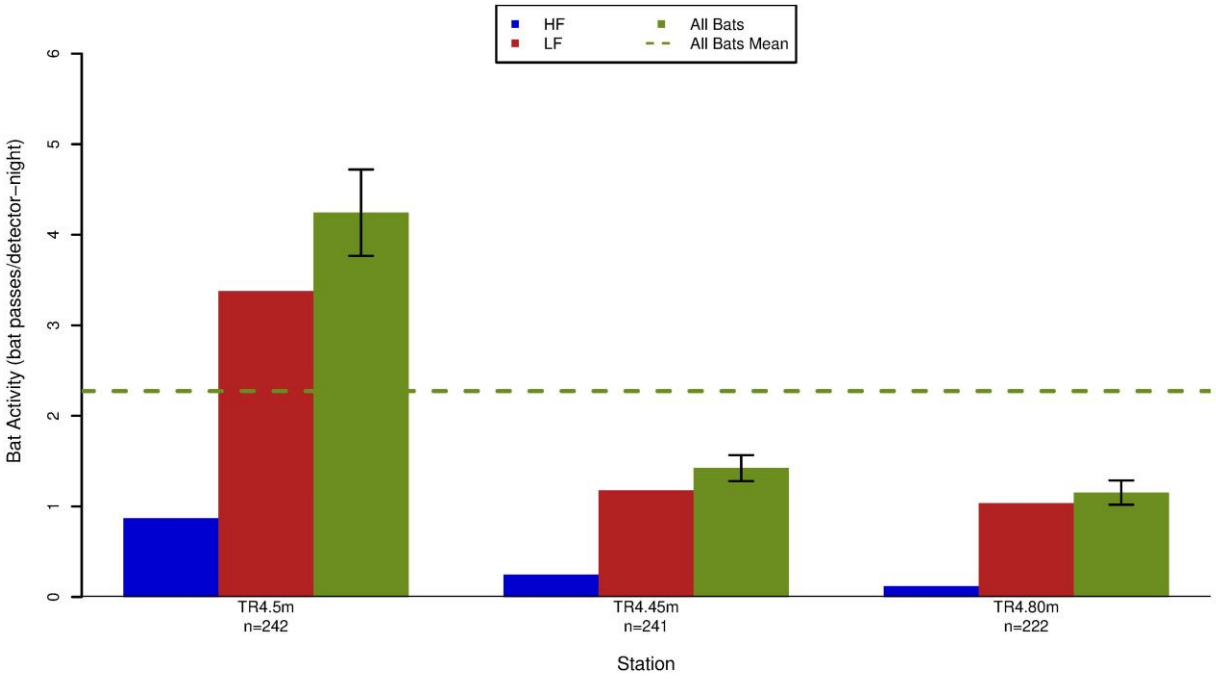

Figure 2. Number of high-frequency (HF) and low-frequency (LF) bat passes per detector-night recorded at AnaBat detectors in the Timber Road IV Wind Farm from July 16, 2017 – July 15, 2018. The bootstrapped standard errors are represented by the black error bars on the "All Bats" columns.

Seasonal Variation

Overall bat activity at the TRIV was highest during the fall (3.56 ± 0.36 bat passes per detector-night), followed by summer (1.77 ± 0.20 bat passes per detector-night), and lowest during the spring (0.32 ± 0.08 bat passes per detector-night). This same pattern was observed for both HF and LF bats and at each of the detectors, regardless of microphone height (Table 4, Figure 3).

Table 4. The number of bat passes per detector-night recorded at meteorological tower in the Timber Road IV Wind Farm during each season from July 16, 2017 – July 15, 2018, separated by call frequency: high frequency (HF), low frequency (LF), and all bats (AB).

Detector	Call Frequency	Fall July 16 – Nov 15, 2017	Spring March 14 – May 15, 2018	Summer May 16 – July 15, 2018
TR4-5m	LF	5.18	0.32	2.80
	HF	1.44	0.13	0.46
	AB	6.62	0.45	3.26
TR4-45m	LF	1.89	0.16	0.87
	HF	0.46	0.02	0.07
	AB	2.35	0.17	0.93
TR4-80m	LF	1.52	0.30	1.02
	HF	0.19	0.03	0.08
	AB	1.71	0.33	1.10
Ground Totals	**LF**	**5.18±0.71**	**0.32±0.11**	**2.80±0.46**
	HF	**1.44±0.21**	**0.13±0.04**	**0.46±0.08**
	AB	**6.62±0.86**	**0.45±0.12**	**3.26±0.49**
Raised Totals	**LF**	**1.70±0.20**	**0.23±0.07**	**0.94±0.15**
	HF	**0.33±0.06**	**0.02±0.01**	**0.07±0.02**
	AB	**2.03±0.21**	**0.25±0.08**	**1.02±0.16**
Overall	**LF**	**2.86±0.30**	**0.26±0.07**	**1.56±0.19**
	HF	**0.70±0.10**	**0.06±0.02**	**0.20±0.03**
	AB	**3.56±0.36**	**0.32±0.08**	**1.77±0.20**

Sums may not add up due to rounding

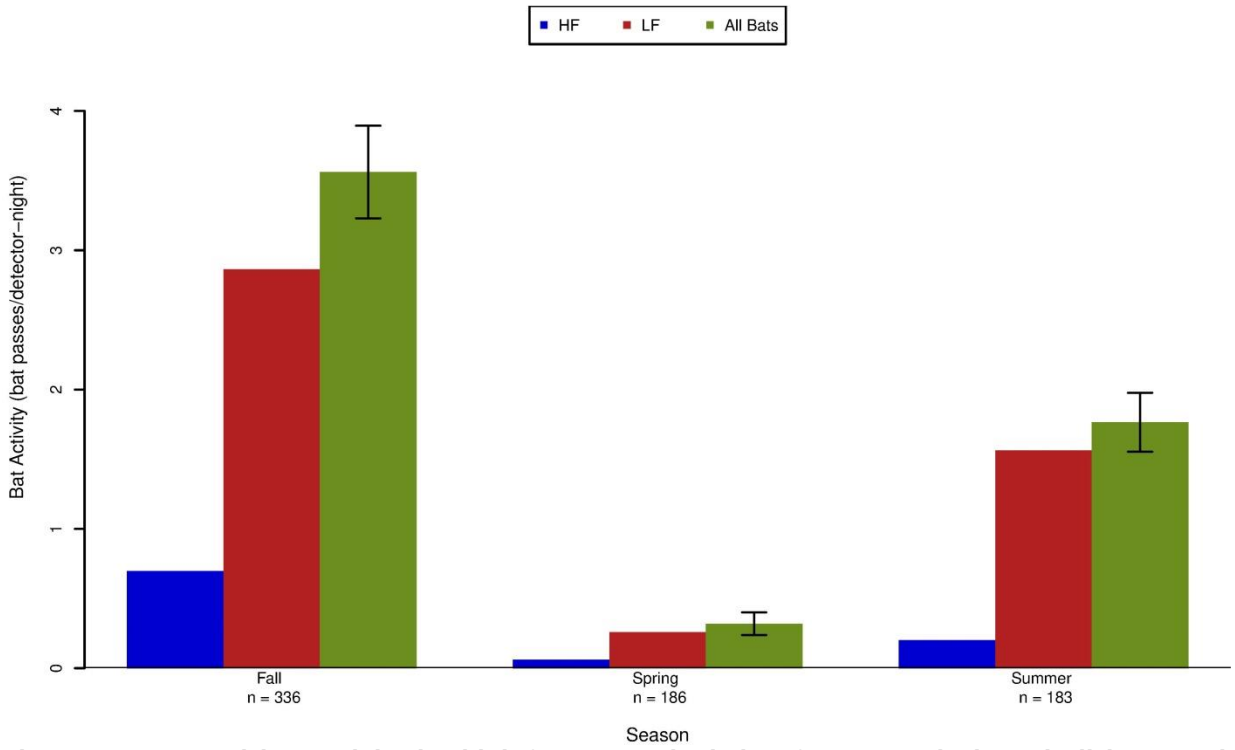

Figure 3. Seasonal bat activity by high-frequency (HF), low-frequency (LF), and all bats at the Timber Road IV Wind Farm from July 16, 2017 – July 15, 2018. The bootstrapped standard errors are represented on the "All Bats" columns.

Weekly acoustic activity was highest from August 14 to August 23, 2017 (Table 5). Bat acoustic activity gradually decreased after the last week of August. High-frequency bat activity gradually decreased throughout the remainder of August; by September HF bat activity averaged less than one bat pass per detector-night. LF bat activity gradually declined after mid-October, with the average number of bat passes per detector-night averaged less than one bat pass per detector-night after the week of October 22 (Figure 4).

Table 5. Periods of peak activity for high-frequency (HF), low-frequency (LF), and all bats at the Timber Road IV Wind Farm for the study period July 16, 2017 – July 15, 2018.

Frequency Group	Start Date of Peak Activity	End Date of Peak Activity	Bat Passes per Detector-Night
HF	August 14	August 20	4.2
LF	August 17	August 23	8.6
All Bats	August 14	August 20	12.6

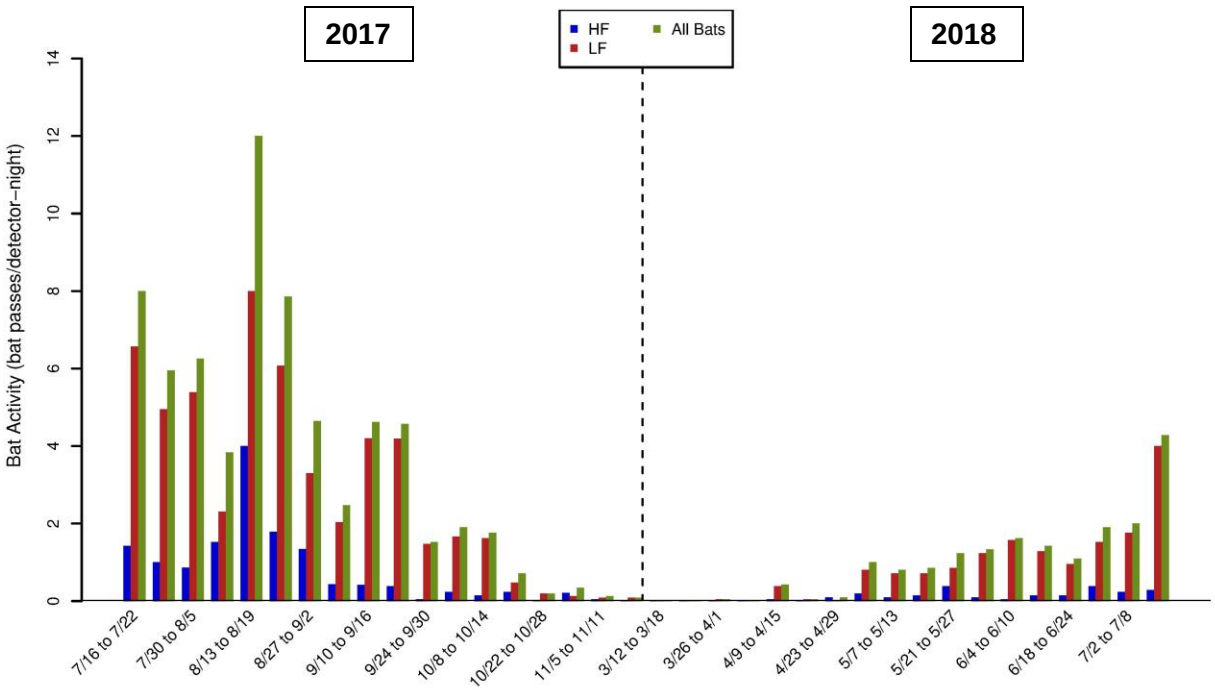

Figure 4. Weekly patterns of bat activity by high-frequency (HF), low-frequency (LF), and all bats at the Timber Road IV Wind Farm for the study period July 16, 2017 – July 15, 2018. Vertical dashed line indicates end of fall 2017 and beginning of spring 2018 monitoring.

Species Composition

A total of 1,626 bat passes were recorded at TRIV from July 16, 2017, to July 15, 2018. A total of 1,467 call sequences were categorized via qualitative identification with a species or species group (when similarity between calls of species was too similar to differentiate between two species). A total of 139 LF bat passes and 20 HF bat passes were too poor of a quality to identify to species or species group. Across all microphone heights the majority (52.5%, 854 bat passes) of calls were identified as big brown/silver-haired bats. The next most commonly recorded species were eastern red bat (16.2%, 264 bat passes) and hoary bat (11.4%, 185 bat passes). Activity was generally higher on the 5-m detector with the exception of hoary and silver-haired bat activity, which was higher at the 45-m and 80-m detector compared to the 5-m detector. No bat calls were identified as *Myotis* species (Table 6, Figure 5).

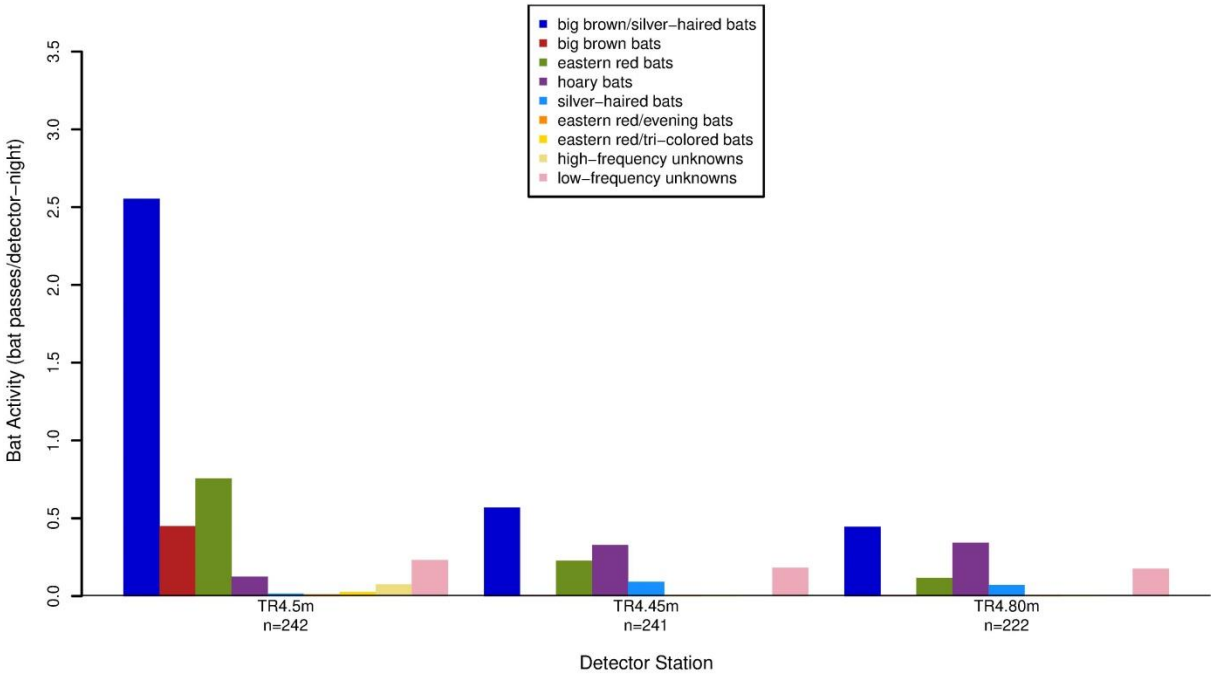

Figure 5. Number of bat passes per detector-night for each species or species group recorded at AnaBat detectors at the metrological tower in the Timber Road IV Wind Farm from July 16, 2017 – July 15, 2018.

Table 6. Summary of qualitative call identifications* for each acoustic monitoring detector at the Timber Road IV Wind Farm from July 16, 2017 – July 15, 2018.

Detector	EPFU/LANO	EPFU	LABO	LACI	LANO	LABO/NYHU	LABO/PESU	UNHF	UNLF	Total
TR4-5m	618	109	183	30	4	3	6	18	56	1,027
TR4-45m	137	2	55	79	22	1	1	2	44	343
TR4-80m	99	0	26	76	16	0	0	0	39	256
Total	**854**	**111**	**264**	**185**	**42**	**4**	**7**	**20**	**139**	**1,626**

*EPFU – *Eptesicus fuscus* - big brown bat; LANO – *Lasionycteris noctivagans* - silver-haired bat; LABO – *Lasiurus borealis* - eastern red bat; NYHU – *Nycticeius humeralis* - evening bat; LACI – *Lasiurus cinereus* -hoary bat; PESU – *Perimyotis subflavus* - tri-colored bat; UNHF – unknown high-frequency species; UNLF – unknown low-frequency species

Bat Acoustic Surveys from May 4, 2017, to July 15, 2018

A total of 1,918 bat passes were recorded at TRIV from May 4, 2017, to July 15, 2018. A total of 1,721 call sequences were categorized via qualitative identification with a species or species group (when similarity between calls of species was too similar to differentiate between two species). A total of 176 LF bat passes and 22 HF bat passes were too poor of a quality to identify to species or species group. Across all microphone heights the majority (56.9%; 980 bat passes) of calls were identified as big brown/silver-haired bats. The next most commonly recorded species was eastern red bat (18.8%, 324 bat passes). Hoary bat activity was similar across all microphone heights (five m, n=68; 45 m, n=82; 80 m, n=77). Additionally, silver-haired bat activity was similar across all microphone heights (5 m, n=20; 45 m, n=22; 80 m, n=16). Big brown bat activity did not follow the same trend as other LF species activity. Big brown bat calls were recorded much more commonly at the ground-based microphone (n=116) than raised microphones (45 m, n=2; 80 m, n=0). Eastern red bats were recorded more commonly at the ground-based microphone (n=242) than raised microphones (45 m, n=55; 80 m, n=27). Evening bat calls were not commonly recorded at any microphone height, and were only recorded at the ground-based microphone (n=2). No bat calls were identified as *Myotis* species (Figure 6, Table 7).

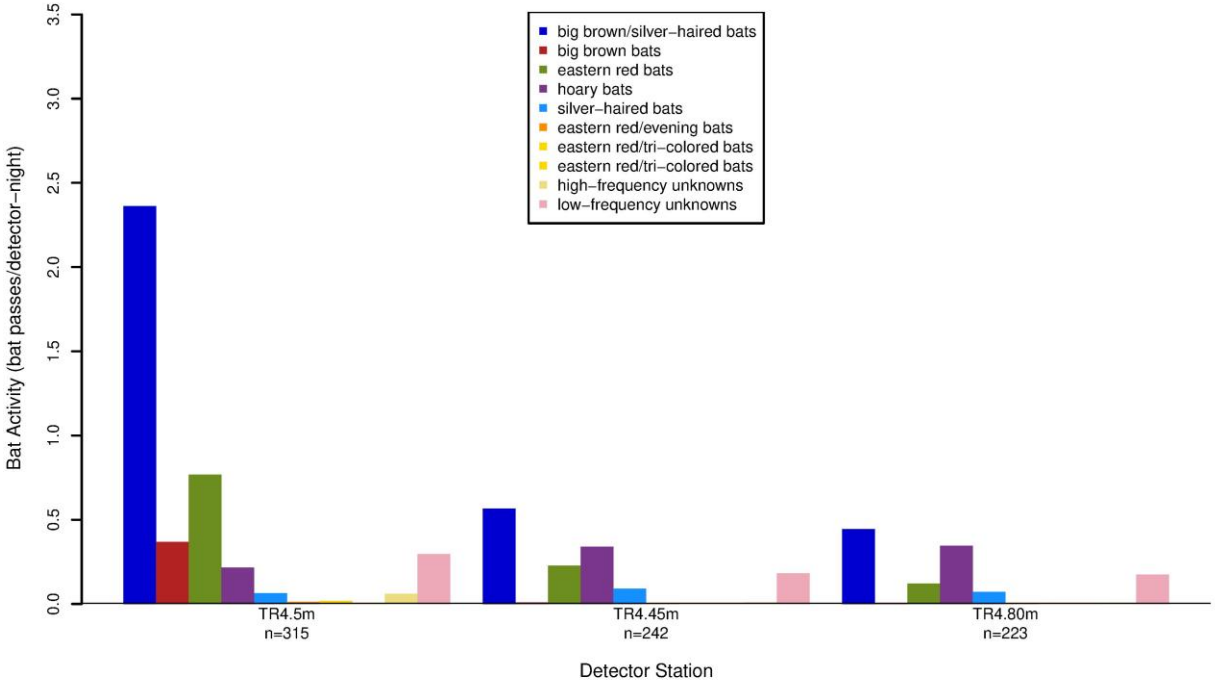

Figure 6. Number of bat passes per detector-night for each species or species group recorded at AnaBat detectors in the Timber Road IV Wind Farm from May 4, 2017 – July 15, 2018.

Table 7. Summary of qualitative call identifications* for each acoustic monitoring detector at the metrological tower at the Timber Road IV Wind Farm from May 4, 2017 – July 15, 2018.

Detector	EPFU/LANO	EPFU	LABO	LACI	LANO	LABO/NYHU	LABO/PESU	NYHU	UNHF	UNLF	Total
TR4-5m	744	116	242	68	20	4	6	2	19	93	1,314
TR4-45m	137	2	55	82	22	1	1	0	2	44	346
TR4-80m	99	0	27	77	16	0	0	0	0	39	258
Total	**980**	**118**	**324**	**227**	**58**	**5**	**7**	**2**	**21**	**176**	**1,918**

*EPFU – *Eptesicus fuscus* - big brown bat; LANO – *Lasionycteris noctivagans* - silver-haired bat; LABO – *Lasiurus borealis* - eastern red bat; NYHU – *Nycticeius humeralis* - evening bat; LACI – *Lasiurus cinereus* -hoary bat; PESU – *Perimyotis subflavus* - tri-colored bat; UNHF – unknown high-frequency species, UNLF – unknown low-frequency species

CONCLUSIONS

No known federally and/or state endangered or threatened species calls, or any *Myotis* species calls were recorded or identified during the study. The majority of calls recorded were from the silver-haired/big brown bat group, followed by eastern red bats. The peak of bat activity was recorded in August, and was mainly attributed to the relatively high number of bat passes identified as silver-haired/big brown bat group. The 5-m detector recorded significantly more calls during all seasons. Overall, the study at the TRVI presents bat species composition and seasonal patterns that are similar to other Midwestern wind energy facilities in similar landscapes.

Acoustic surveys at the Timber Road II Wind Farm (TRII) were conducted at the only met tower within the TRII in the fall of 2011 (August 1 to November 15), 2014 (March 31 to November 17), and 2015 (April 1 – July 31), and at the only met tower within the Timber Road III Wind Farm (TRIII) from March 15 – November 16, 2017. Surveys at both TRII and TRIII were conducted at two detectors with microphones raised at five m (ground) and 45 m (raised), as per ODNR protocol. Bat activity rates at the TRIV were lower or similar to TRII and TRIII (Table 8). Species composition collected at the TRII and TRIII were also similar to TRIV, with the majority of the bat passes classified as LF species and usually belonging to the big brown/silver-haired bat group. However, the composition of bats from acoustic data at the TRII and TRIII differs from the majority of bats found as fatalities at these projects: eastern red, followed by silver-haired, and hoary bat carcasses. In addition, no Indiana or northern long-eared bats calls have been identified from acoustic data, but two Indiana bat fatalities have been found at the TRII (Ritzert et al. 2012; Good et al. 2015, 2016; Iskali and Riser-Espinoza 2018). Standard acoustic surveys are of limited use in predicting risks to bats. Post-construction monitoring data from nearby facilities may provide a better predictor of risk. Therefore, the best predictor of risk to bats at the TRIV may not be acoustic data, but post-construction monitoring from adjacent facilities like TR II and TRIII.

Table 8. Bat activity (number of bat passes per detector night) comparison between Timber Road II, III and IV Wind Farms from 2011 – 2018.

Project	Season	5-m Detector	45-m Detector
Timber Road II	Fall 2011	17.40	7.24
Timber Road II	Spring-Fall 2014	5.73	6.57
Timber Road II	Spring-Summer 2015	3.55	3.50
Timber Road III	Spring-Fall 2017	6.50	2.31
Timber Road IV	Fall 2017-Summer 2018	4.24	1.42

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Summary: Notice of Second Supplement to Application – Update to Exhibit R, Bat Acoustic Survey electronically filed by Christine M.T. Pirik on behalf of Paulding Wind Farm IV LLC