

**Firelands Wind, LLC
Case No. 18-1607-EL-BGN**

Application Part 9 of 17

Part 9 includes:

- **Exhibit Y Bat Mist-Netting Reports**

Date Filed: January 31, 2019

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Exhibit Y

Bat Mist-Netting Reports

- 1. 2018 Bat Mist-Net Survey for the Emerson North Wind Project, Erie, Huron, and Seneca Counties, Ohio dated September 27, 2018**
- 2. 2017 Emerson Creek North Wind Project Bat Mist Netting Survey Report, Erie and Huron Counties, Ohio dated October 31, 2017**
- 3. 2017 Emerson Creek Wind Project Bat Mist Netting Survey Report, Huron County, Ohio dated December 4, 2017**
- 4. Summer Indiana Bat Studies for the Emerson Creek Wind Resource Area Seneca and Huron Counties, Ohio dated December 3, 2012**
- 5. Indiana Bat Mist Net Survey Report dated October 2011**

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Final Report

2018 Bat Mist-Net Survey for the Emerson North Wind Project, Erie, Huron, and Seneca Counties, Ohio

USFWS No. 18-016

Completed by:

Theresa Wetzel, Chris McNees, and Chris Leftwich

27 September 2018

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PROJECT BACKGROUND

In 2017, Copperhead Environmental Consulting, Inc. (Copperhead) completed a bat mist-net survey for the Emerson North Wind Project (Project) in Erie and Huron Counties, Ohio (Copperhead 2017). Since completion of the 2017 survey, the Project boundary was expanded to include an additional 386 acres of forested habitat in Erie and Seneca Counties, and Copperhead was contracted to complete mist-net surveys in the unsurveyed portion of the Project in 2018. In addition, Copperhead also completed a mist-net survey within the outer-tier of a 5-mile conservation buffer around an Indiana bat (*Myotis sodalis*) acoustic record from a previous survey to reduce the conservation buffer to 2.5 miles if probable absence was documented. The expansion area and the outer-tier of the Indiana bat buffer together are referred to as the 'Survey Area' (Figure 1).

The goals of these surveys were to document bat species diversity and abundance within the Survey Area, and inform understanding of roosting habitat, foraging range, and spatial distribution of federally listed Indiana bats and northern long-eared bats (*Myotis septentrionalis*), and state listed Rafinesque's big-eared bats (*Corynorhinus rafinesquii*), and eastern small-footed bats (*Myotis leibii*), if captured.

METHODOLOGY

Level of Effort/Site Selection

Mist-net surveys were implemented in accordance with guidelines outlined in the *2018 Range-wide Indiana Bat Summer Survey Guidelines* (USFWS 2018), *2009 Ohio Department of Natural Resources On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio* (ODNR 2009), and the most recent *Ohio Division of Wildlife Guidance for Bat Permitted Biologist* (ODNR-DOW 2018). The study plan was submitted to USFWS on 18 May 2018 and their approval to proceed was received on 22 May 2018. Additionally, ODNR was notified of the study plan on 18 May 2018 in accordance with permit requirements.

The level of effort outlined in the study plan was based on the estimated amount of forested habitat within the Survey Area (~539 acres), resulting in 5 mist-net sites (45 net nights; Figure 1).

Mist-Net Surveys

Mist-nets were set up to maximize coverage of flight paths used by bats along suitable travel corridors, foraging areas, or drinking areas. Placement of mist-nets were based on the extent of canopy cover, presence of an open flyway, and forest conditions near the

site. Actual location and orientation of each net was determined in the field by permitted biologists and mapped with ArcGIS (v. 10.5 ESRI, Redlands, CA).

Mist-net sites were surveyed for 2 nonconsecutive nights for a total of 9 net nights per site. Each site consisted of 3 to 4 double-high net sets (2 nets stacked; 5.2 meters tall) and 1, 3 high net set (3 mist-nets stacked; 7.5 meters tall). Low visibility, high-quality, nylon nets, 4 to 12 meters (~13 - 42 feet) in length (depending upon the width of the corridor) were used for each net set. Nets were deployed at sunset each night, left open for at least 5 hours, and checked every 10 minutes.

Disturbance near the nets was kept to a minimum between checks. Weather data, including temperature, wind speed, and cloud cover, were recorded for each site on an hourly basis to ensure compliance with the mist-netting guidelines (e.g., temperature during survey > 50°F).

Bats were live-caught and released unharmed near the point of capture. Data recorded for each individual included time of capture, capture net, capture height, species, sex, age class, reproductive condition, mass, and forearm length. Representative photographs were taken of each species captured at each mist-net site as state and federal protocols mandate (ODNR 2009, USFWS 2018). Processing of bats was completed within 30 minutes from the time the bat was removed from the net.

White-Nose Syndrome Protocol

To minimize the transmission of White-Nose Syndrome (WNS) between captured bats, all netting and field activities followed the most up-to-date guidelines of the *National White-nose Decontamination Protocol* (2016). All hard, non-porous netting equipment was sanitized with Isopropyl alcohol wipes (70%) prior to arrival at the project site and after each survey night; all other equipment was submersed in hot water (55°C) for a minimum of 20 minutes. Disposable latex gloves were worn over sanitized handling gloves and changed following the handling of each bat. All non-disposable equipment, e.g., PESOLA® scales, rulers, calipers, etc., coming into contact with bats was sanitized immediately following the handling of each bat. Bats were evaluated for potential WNS infection through wing scoring following the Wing-Damage Index (Reichard and Kunz 2009).

Radio-Telemetry & Emergence Counts

If federally or state listed bats were captured or more than 10 reproductive females or juveniles of non-listed species, radio transmitters would be attached to individuals to locate day roosts, conduct emergence counts, and to estimate foraging ranges in accordance with state and federal protocols (ODNR 2009, USFWS 2018).



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Emerson North Wind Project Project Location and Mist-net Sites



Erie, Huron, and Seneca
Counties, Ohio

H Acoustic Detection Site

- Mist-net Sites, 2018
- Survey Area, 2017
- Survey Area, 2018
- 2.5 Mile Buffer
- 5 Mile Buffer

Coordinate System:
 NAD 1983 StatePlane
 Ohio North FIPS 3401
 Feet
 Projection: Lambert
 Conformal Conic
 North
 American 1983
 Sources: Apex Clean
 Energy, ESRI, USGS
 Date: 9/26/2018

1:180,000
 or
 1 cm = 2 km

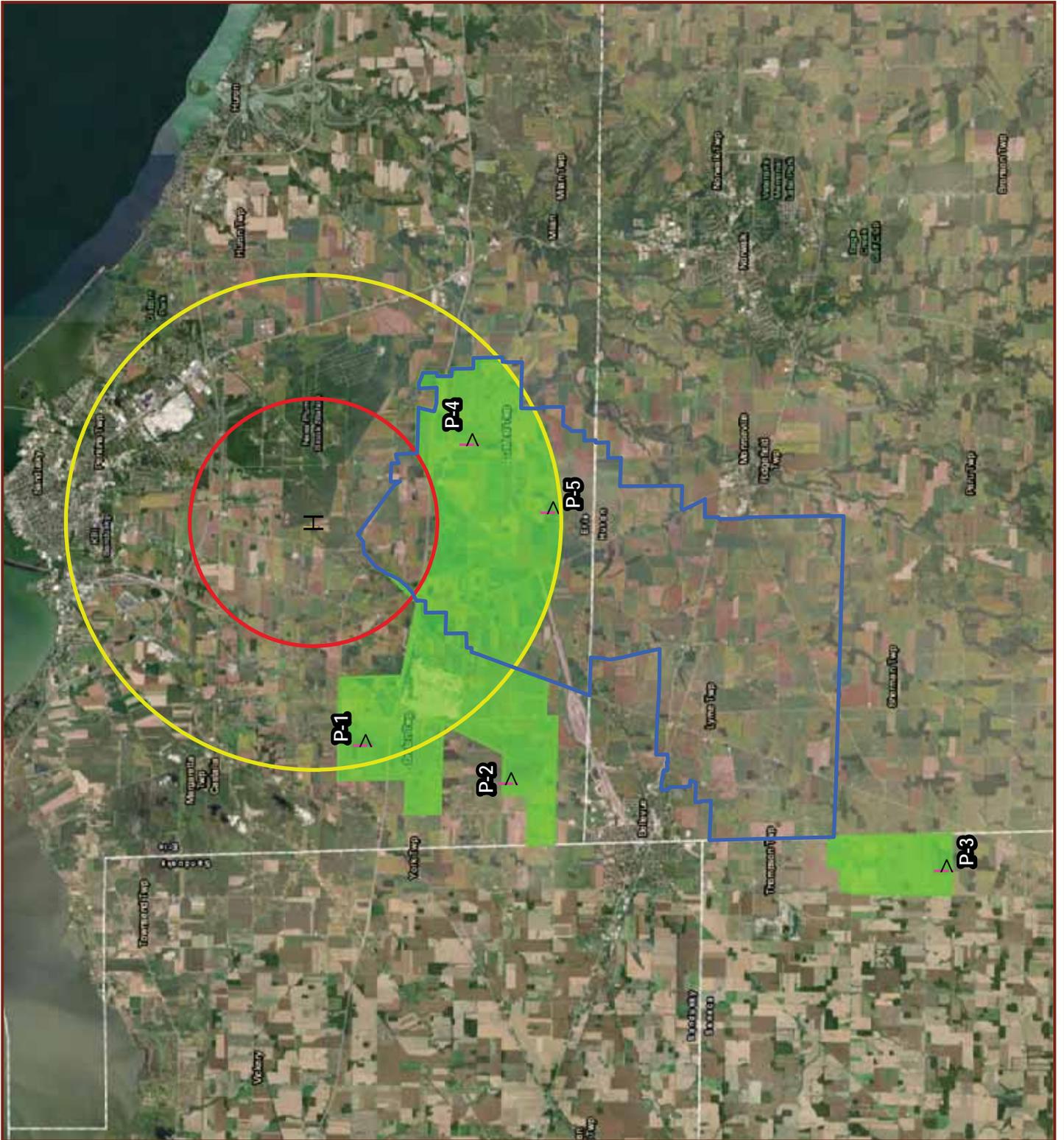
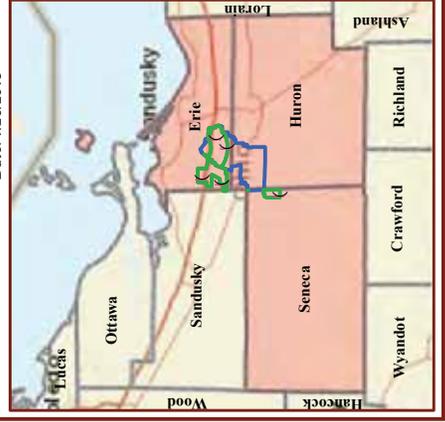
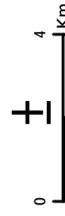


Figure 1. Proposed Emerson North Wind Project area and bat survey mist-net sites, Erie, Huron, and Seneca Counties, OH, 2018

RESULTS AND DISCUSSION

Mist-Net Survey

Mist-net surveys were completed at 5 sites from 25 - 30 June 2018 (Table 1, Figure 1). A total of 16 bats of 2 species were captured, none of which were federally or state listed (Table 2). Big brown bats (*Eptesicus fuscus*) comprised 88% of total captures (n=14) and eastern red bats (*Lasiurus borealis*) comprised 12% of total captures (n=2). Completed bat capture data sheets are provided in Appendix A, photographs of mist-net sites are provided in Appendix B, and representative photographs of each bat species captured are provided in Appendix C.

Mist-netting surveys did not result in the capture of federally or state listed bats so subsequent radio-telemetry efforts were not completed.

Table 1. Mist-net site locations, Emerson North Wind Project, Erie and Seneca Counties, Ohio, 2018.

Site Name	Latitude	Longitude	County	Site Location
P-1	41.35519	-82.80196	Erie	Small woodlot/field edge south of Mason Rd
P-2	41.31224	-82.81667	Erie	Woodlot north of Knauss Rd
P-3	41.18470	-82.84955	Seneca	Woodlot south of CR 46 and west of CR 269
P-4	41.32390	-82.68479	Erie	Woodlot north of Strecker Rd and east of Ransom Rd
P-5	41.30017	-82.71125	Erie	Small woodlot east of Patten Track Rd

Table 2. Total bat captures by species, age, sex, and reproductive status, Emerson North Wind Project, Erie and Seneca Counties, Ohio, 2018.

Species	Adult			Unknown*	Total
	Male	Female			
	NR	P	L		
<i>Eptesicus fuscus</i>	9	1	3	1	14
<i>Lasiurus borealis</i>	2	0	0	0	2
Total					16

NR=non-reproductive, P = Pregnant, L=lactating

*Bat escaped before processing

CONCLUSIONS

No federally or state listed species were captured during this survey. As such, USFWS confirmed that the conservation buffer around the acoustic Indiana bat call detected to the NE of the Project can be reduced from 5 miles to 2.5 miles (Angela Boyer and Copperhead, per. comm., May 3, 2018; Keith Lott and Apex, pers. comm., June 11, 2018).

Results of this survey suggest probable summer absence of the target species; therefore, risk of the project impacting these species during the summer maternity period (May 15 to Aug 15) is not evident.

LITERATURE CITED

- Copperhead Environmental Consulting (Copperhead). 2017. 2017 Emerson Creek North Wind Project Bat Mist Netting Survey Report, Erie and Huron Counties, Ohio. Prepared for Apex Clean Energy. October 2017.
- National White-Nose Syndrome Decontamination Protocol, Version 04.12.2016. https://www.whitenosesyndrome.org/sites/default/files/files/national_wns_decon_protocol_04.12.2016.pdf.
- Ohio Division of Natural Resources (ODNR). 2009. On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio: An Addendum to the Ohio Department of Natural Resource's Voluntary Cooperative Agreement.
- Ohio Division of Natural Resources – Division of Wildlife (ODNR-DOW). 2018. Ohio Division of Wildlife and USFWS (OH Field Office) Guidance for Bat Permitted Biologist.
- Reichard, J. D. and T. H. Kunz. 2009. White-nose syndrome inflicts lasting injuries to the wings of little brown myotis (*Myotis lucifugus*). *Acta Chiropterologica*, 11(2) 457-464.
- United States Fish and Wildlife Service (USFWS). 2018. Range-wide Indiana Bat Summer Survey Guidelines.

APPENDIX A

Mist-Net Data Sheets

Site No. P-1 Project Phase# 664.02 Project Name Emerson North Dates 26, 28 Jun 2018
 Site Location Small wooded / field edge south of Mason Rd Habitat Type Upland Forest
 County Eric State DH Permittee Zack Baer Technician(s) Ian Berns
 Lat/Long or UTM (circle one): S/Easting 41.35519 N Northing -82.20196 UTM Zone NAD 83

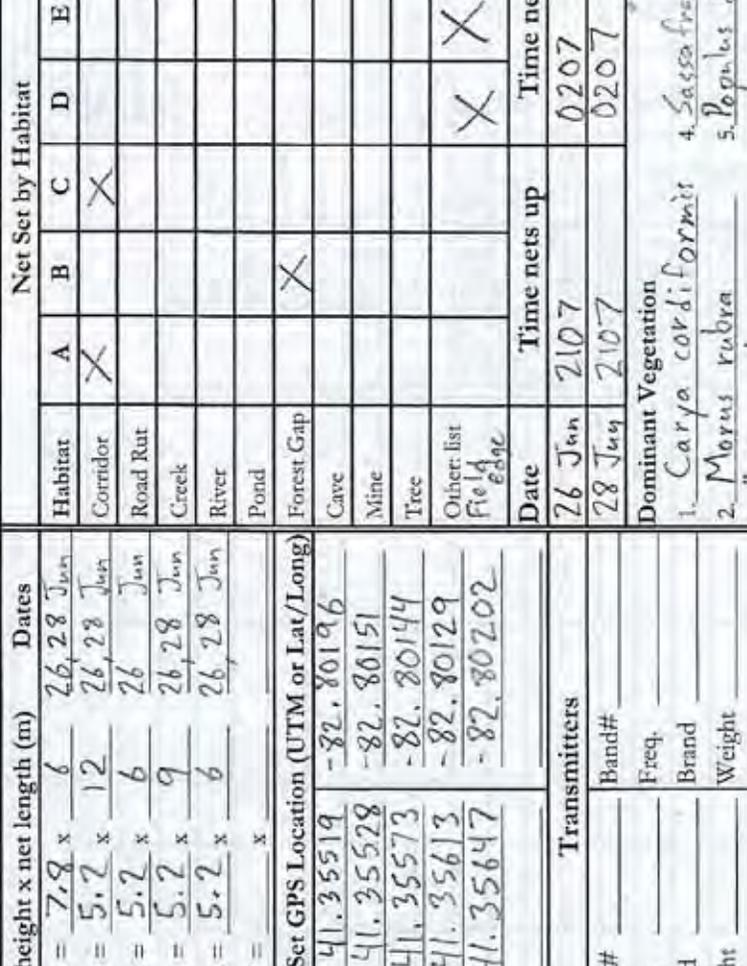


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#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments	Date	Time	Temp (°F)	Sky	Wind	Comments
1	26 Jun	0025	EPFU	A	M	NR	18.75	48	A	6	0				26 Jun	2107	71	1	1	
2	26 Jun	0025	EPFU						D	3		ESCAPED FROM		NET-	26 Jun	2207	70	2	1	
3	26 Jun	0200	EPFU	A	M	NR	16.75	45	A	5.5	0				26 Jun	2307	69	3	2	
1	28 Jun	2345	EPFU	A	F	P	21.25	48	B	4.5	0				26 Jun	0007	68	3	2	
2	28 Jun	0015	EPFU	A	M	NR	19.25	47	B	2	0				26 Jun	0107	68	3	2	
3	28 Jun	0205	EPFU	A	F	L	20.25	48	E	2	0				26 Jun	0207	67	2	2	
															28 Jun	2107	74	1	0	
															28 Jun	2207	71	1	0	
															28 Jun	2307	70	1	0	
															28 Jun	0007	70	1	0	
															28 Jun	0107	69	2	0	
															29 Jun	0207	68	2	1	

Species Abbreviations: *Corynorhinus virginicus* (CORV); *Corynorhinus t. virginicus* (COV); *Eptesicus fuscus* (EPFU); *I. astutus borealis* (LABO); *I. astutus cinereus* (LACI); *I. astutus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis anstroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius borealis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)
 Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
 * Habitat Type: Crock/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Net Site Diagram



Net height x net length (m)	Dates
A = 7.8 x 6	26, 28 Jun
B = 5.2 x 12	26, 28 Jun
C = 5.2 x 6	26 Jun
D = 5.2 x 9	26, 28 Jun
E = 5.2 x 6	26, 28 Jun
F = x	

Net Set GPS Location (UTM or Lat/Long)	
A =	41.35519
B =	41.35528
C =	41.35573
D =	41.35613
E =	41.35647
F =	

Net Set by Habitat						
Habitat	A	B	C	D	E	F
Corridor	X		X			
Road Rut						
Creek						
River						
Pond						
Forest Gap		X				
Cave						
Mine						
Tree						
Other: list						
Field edge				X	X	

Date	Time nets up	Time nets down
26 Jun	2107	0207
28 Jun	2107	0207

Potential listed bat habitat at site:

Roost habitat: 1. **Poor:** No or few snags $\geq 5'$ DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present $\sim 5-15$ inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present $> \sim 15$ inch DBH within 1000 feet of forested areas.

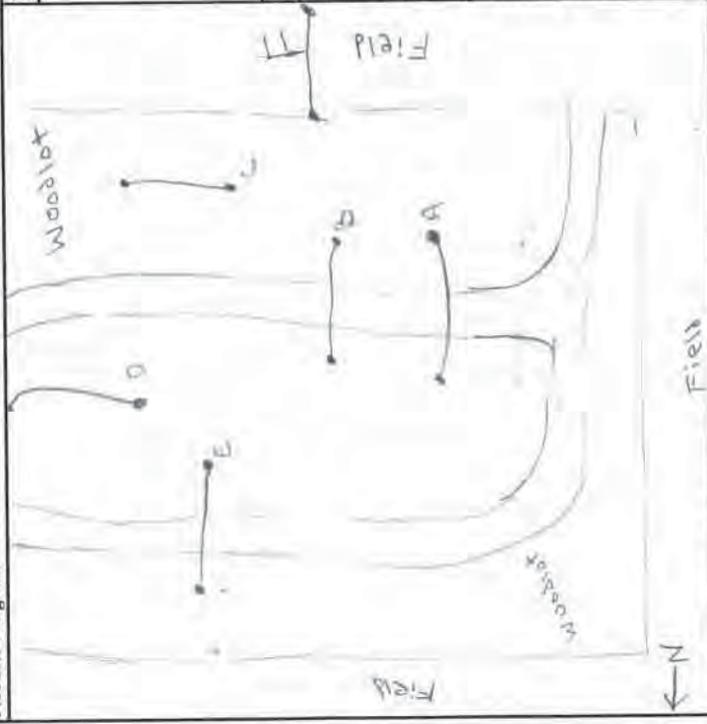
Water Resources: 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Net Site Diagram



Net height x net length (m)		Dates
A =	5.2 x 1.2	26 June
B =	5.2 x 6	26 June
C =	5.2 x 9	26 June
*D =	7.8 x 12	26 June
E =	5.2 x 6	26 June
F =	7.8 x 12	28 June

Net Set GPS Location (UTM or Lat/Long)	
A =	41.31224 -82.81667
B =	41.31259 -82.81644
C =	41.31278 -82.81614
D =	41.31289 -82.81647
E =	41.31284 -82.81681
F =	41.31211 -82.81652

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor	X	X			X	
Road Rut						
Creek						
River						
Pond				X		
Forest Gap						
Cave						
Mine						
Tree						
Other: list						eggs X

Date	Time nets up	Time nets down
26 June	21:07	02:07
28 June	21:07	02:07

Dominant Vegetation

1. *Carya ovata*
2. *Celtis occidentalis*
3. *Juglans nigra*
4. *Quercus bicolor*
5. _____
6. _____

Potential listed bat habitat at site:

- Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.
 - Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road cuts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.
 - Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/ foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
 - Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.
- Comments:** *Changed net D to a 5.2 x 12 net on 28 June.

Site No. P-3 Project Phase# 10/01/02 Project Name Emerson North Dates 6/27/2008 6/29/08
 Site Location Woodlot South of CR 46 at West of CR 2091 Habitat Type* Bottomland Forest
 County Seneca State OH Permittee T. Wetzel / Z. Bear Technician(s) T. Burns
 Lat/Long or UTM (circle one) (N) Easting 411840970 (W) Northing 82181954 UTM Zone 18 Datum NAD83



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RPA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments
1	6/27	2145	EPFU	A	M	NR	16.25	50	D	3.0	0			
2	6/27	2145	EPFU	A	M	NR	14.75	40	C	2.0	0			
3	6/27	2145	EPFU	A	M	NR	15.75	45	C	2.0	0			
1	6/29	2320	EPFU	A	M	NR	17.5	45	B	4.5	0			
2	6/29	0207	EPFU	A	F	L	17.0	47	C	3	0			

Date	Time	Temp (°F)	Sky	Wind	Comments
6/27	2100	69	2	1	
6/27	2200	68	2	0	
6/27	2300	69	3	0	
6/27	0000	68	3	1	
6/27	0100	67	3		
6/27	0200	67	3	1	
6/29	2100	81	1	1	
6/29	2200	77	0	1	
6/29	2300	75	0	1	
6/29	0000	75	0	2	
6/29	0100	75	0	1	
6/29	0200	75	0	2	

Sky Code	
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale	
0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COV); *Episticticus fuscus* (EPFU); *Lasiorhynchus borealis* (L.ABC); *Lasiorhynchus atavus* (L.ACL); *Lasiorhynchus seminoleus* (L.ASE); *Lasiorhynchus northrupi* (L.ANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLF); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctinomus humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

* Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Prmd; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. P-3 Project Phase# 0604.02 Project Name Apex Emerson North Dates 6/27/2018, 6/29/18

Net Site Diagram

Net height x net length (m)		Dates
A =	10 x 10	6/27, 6/29
B =	10 x 9	6/27, 6/29
C =	9 x 12	6/27, 6/29
D =	10 x 10	6/27, 6/29
E =	10 x 10	6/27, 6/29
F =	x	

Net Set GPS Location (UTM or Lat/Long)	
A =	41.185816 -82.85188
B =	41.18615 -82.85126
C =	41.18533 -82.85001
D =	41.18547 -82.85074
E =	41.18473 -82.85015
F =	

Net Set by Habitat						
Habitat	A	B	C	D	E	F
Corridor	X			X		
Road Rut		X				
Creek						
River						
Pond						
Forest Gap			X			
Cave						
Mine						
Tree						
Other list						

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

Potential listed bat habitat at site:

3. Roost habitat: 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

2. Water Resources: 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

3. Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging. 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2. Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Dominant Vegetation
 1. *Populus deltoides*
 2. *Celtis occidentalis*
 3. *Acer rubrum*
 4. *Carya ovata*
 5. *Quercus rubra*
 6. *Fagus grandifolia*

Site No. P-4 Project Phase# U4.02 Project Name Alex Emerson Creek Dates 6/25/2018 to 6/29/18
 Site Location Woodlot N of Strecher Rd and W of Ransom Rd. Habitat Type* Upland Forest
 County Exie State OH Permittee J. Wetzel Technician(s) L. Burns, C. Biscan
 Lat/Lon or UTM (circle one): N/Easting 41.32898 W/Northing 82.684794 UTM Zone 18R Datum NAD83



COPPERHEAD
ENVIRONMENTAL CONSULTING

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	REA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments	Date	Time	Temp (°F)	Sky	Wind	Comments	Moon rise	Moon set	Sunrise	Sunset
1	6/25	2225	LABO	A	M	NR	9.75	38	D	4.0	0				6/25	2100	68	0	0		1853	0422	0558	2108
1	6/29	2315	EPFU	A	F	L	23.25	50	D	2.5	0				6/29	0100	59	0	0		0715	0600	0600	2108
															6/25	2200	76	0	0					
															6/25	2200	74	0	1					
															6/29	0100	57	0	0					
															6/29	2100	78	0	0					
															6/29	2200	76	0	0					
															6/29	2300	74	0	1					
															6/29	0000	67	0	0					
															6/29	0100	59	0	0					
															6/29	0200	57	0	0					
															6/29	0200	72	0	1					
															6/29	0200	72	0	1					

Sky Code

0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale

0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

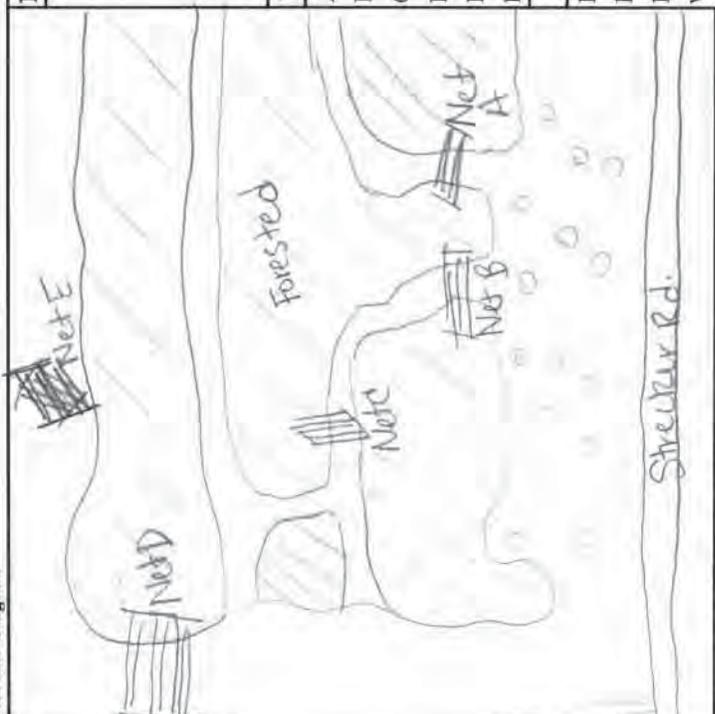
Species Abbreviations: *Corynorhinus rafinesquii* (COR); *Corynorhinus t. virginianus* (COVA); *Epitesicus fuscus* (EPFU); *Epitesicus borealis* (L.ABO); *Lasius alienus* (L.ACI); *Lasius seminolus* (L.ASE); *Lasiopterus noctivagus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NVHU); *Pteromyotis subplanus* (PFSU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

*** Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. H Project Phase# 0104.02 Project Name Apex Emerson Creek Dates 6/25/2018

Net Site Diagram



Net height x net length (m)		Dates	
A =	6 x 9	6/25	6/29
B =	6 x 9	6/25	6/29
C =	6 x 4	6/25	6/29
D =	9 x 9	6/26	6/29
E =	6 x 12	6/25	
F =	x		

Net Set GPS Location (UTM or Lat/Long)	
A =	41.32365 -82.68478
B =	41.32372 -82.68509
C =	41.32384 -82.68530
D =	41.32404 -82.68557
E =	41.32422 -82.68531
F =	

Transmitters	
Band#	
Freq.	
Brand	
Weight	
#days	

Net Set by Habitat	
Habitat	A B C D E F
Corridor	X X X
Road Rut	
Creek	
River	
Pond	
Forest Gap	
Cave	
Mine	
Tree	
Other: list	
Edge	X X
Date	Time nets up Time nets down
6/25/2018	2108 0208
6/29/2018	2109 0208

Dominant Vegetation	
1.	Morus rubra
2.	Pinus strobus
3.	Prunus serotina
4.	
5.	
6.	

Potential listed bat habitat at site:

Roost habitat: 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

Water Resources: 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Net Site Diagram



Net height x net length (m)		Dates
A = 5.2 x 6		25, 27 June
B = 5.2 x 12		25, 27 June
C = 7.0 x 6		25, 27 June
D = 5.2 x 9		25 June
E = 5.2 x 6		25, 27 June
F = x		

Net Set GPS Location (UTM or Lat/Long)	
A = 41, 30016	-82, 71252
B = 41, 30032	-82, 71198
C = 41, 30017	-82, 71125
D = 41, 30050	-82, 71098
E = 41, 29984	-82, 71122
F =	

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor	X		X			
Road/Rut						
Creek						
River						
Pond						
Forest Gap		X		X		
Cave						
Mine						
Tree						
Other: list						

Date	Time nets up	Time nets down
25 June	21 07	0209
27 June	21 07	0207

Dominant Vegetation	
1.	<i>Carya ovata</i>
2.	<i>Acer saccharum</i>
3.	<i>Prunus serotina</i>
4.	
5.	
6.	

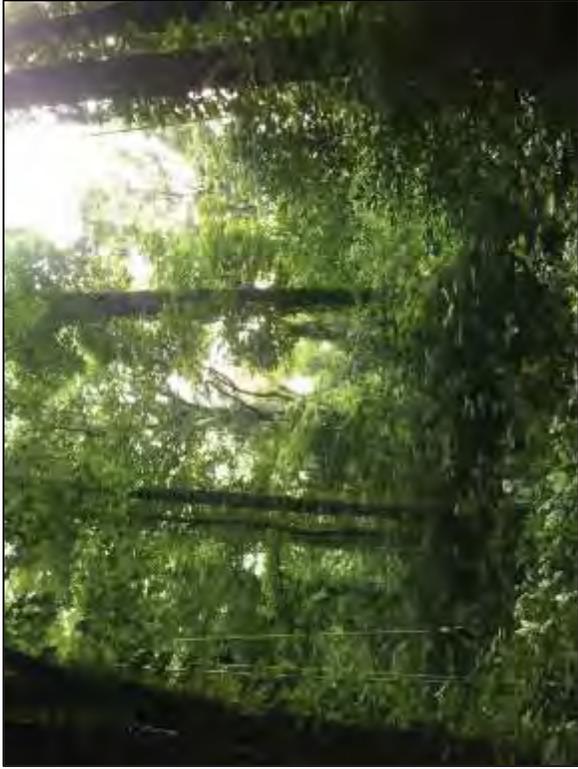
Potential listed bat habitat at site:

- Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.
- Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.
- Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
- Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

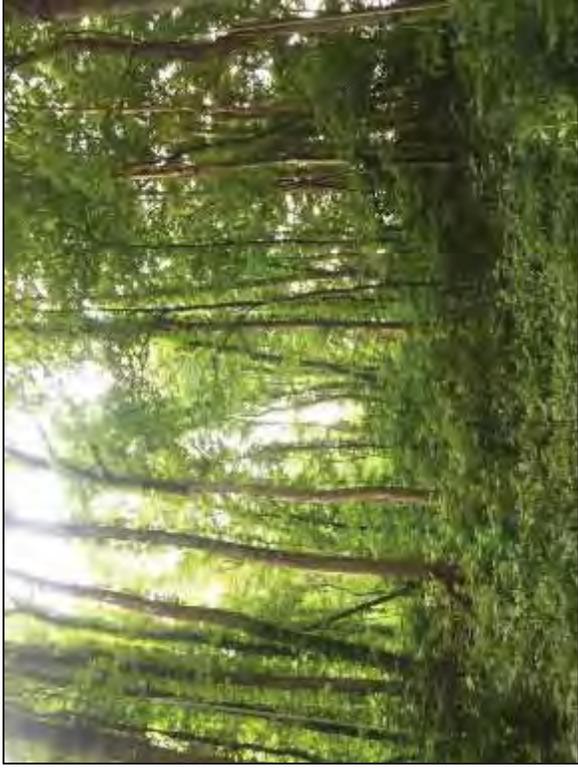
Comments:

APPENDIX B

Mist-Net Site Photographs



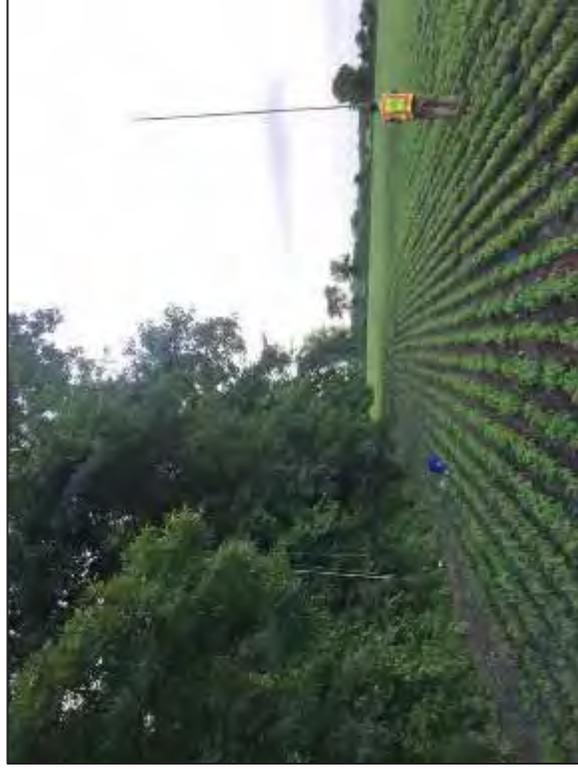
Site P-1 Net A



Site P-1 Net B



Site P-1 Net C



Site P-1 Net D



Site P-1 Net E



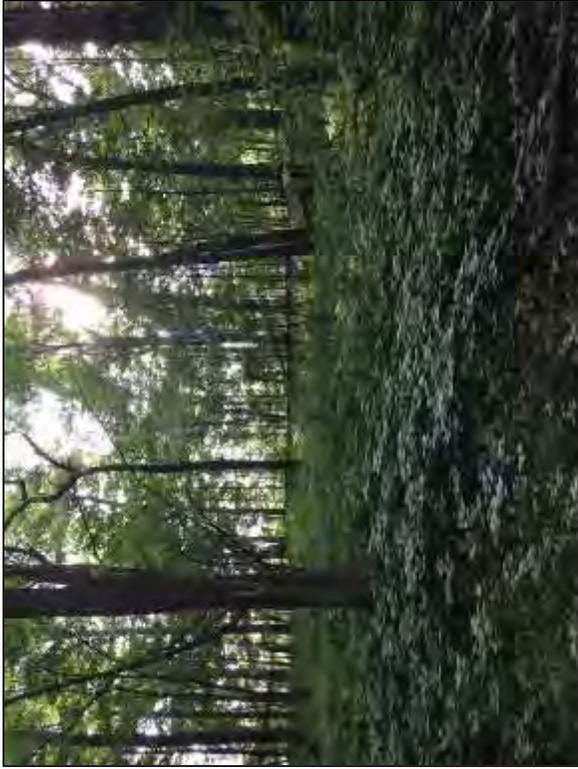
Site P-2 Net A



Site P-2 Net B



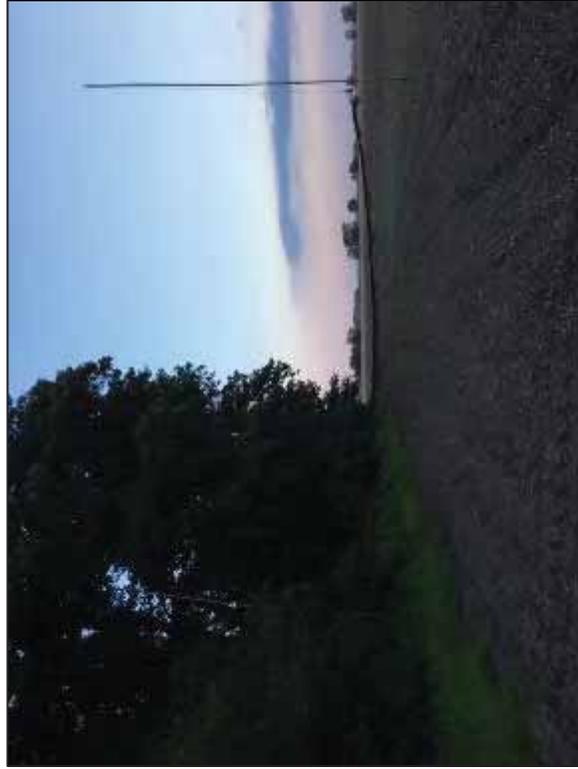
Site P-2 Net C



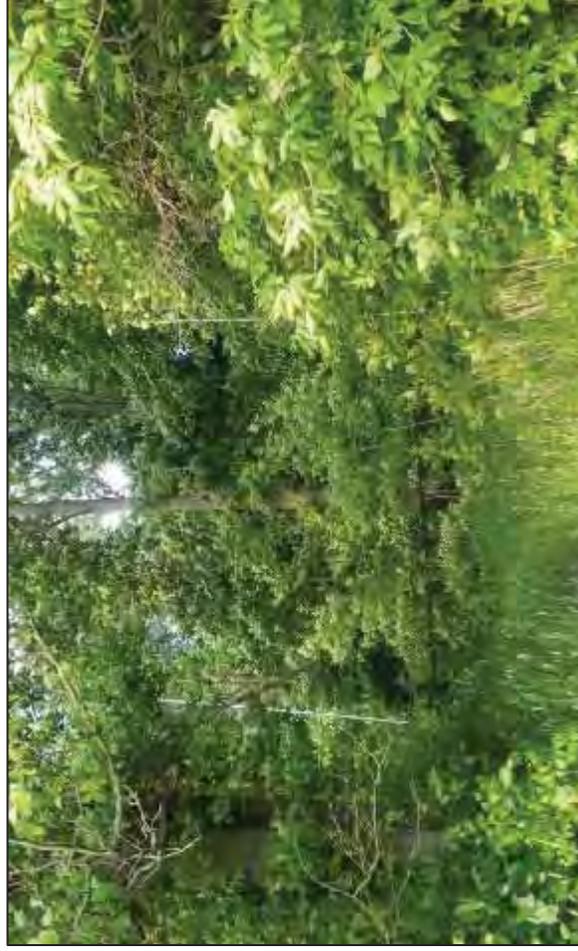
Site P-2 Net D



Site P-2 Net E



Site P-2 Net F



Site P-3 Net A



Site P-3 Net B



Site P-3 Net C



Site P-3 Net D



Site P-3 Net E



Site P-4 Net A



Site P-4 Net B



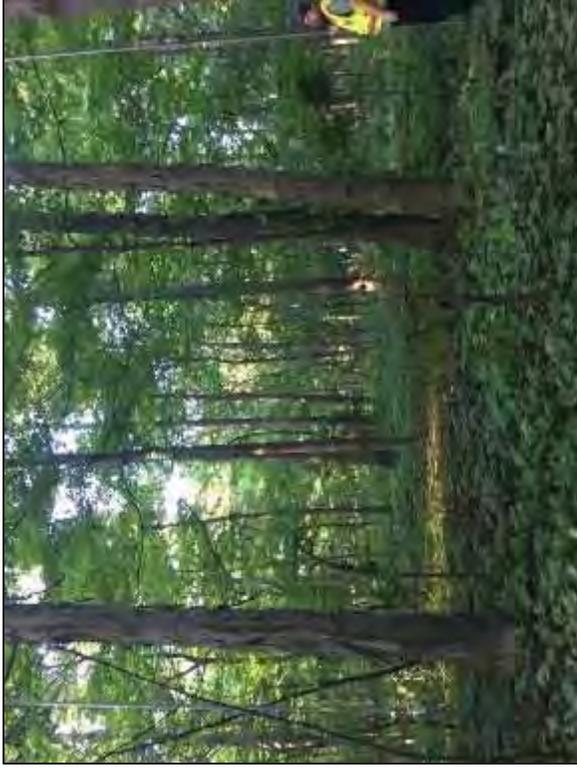
Site P-4 Net C



Site P-4 Net D



Site P-4 Net E



Site P-5 Net A



Site P-5 Net B



Site P-5 Net C



Site P-5 Net D



Site P-5 Net E

APPENDIX C

Bat Capture Photographs



Eastern Red Bat (*Lasiurus borealis*)



Big Brown Bat (*Eptesicus fuscus*)

Exhibit Y

Bat Mist-Netting Reports

2. 2017 Emerson Creek North Wind Project Bat Mist Netting Survey Report, Erie and Huron Counties, Ohio dated October 31, 2017

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(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
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wvorys@dickinsonwright.com

Attorneys for Firelands Wind, LLC



Final Report

2017 Emerson Creek North Wind Project Bat Mist Netting Survey Report, Erie and Huron Counties, Ohio

USFWS No. 17-024

Completed by:

Zachary Baer, Theresa Wetzel, Chris McNees, and Chris Leftwich

31 October 2017

COPPERHEAD ENVIRONMENTAL CONSULTING, INC.
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Business Confidential – Not for Public Disclosure

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- Appendix B: Mist-Net Photographs
- Appendix C: Bat Capture Photographs

PROJECT BACKGROUND

Copperhead Environmental Consulting, Inc. (Copperhead) conducted a bat mist-net survey for the proposed Emerson Creek North Wind Project (Project) in Erie and Huron Counties, Ohio (Figure 1). The goals of this survey were to document bat species diversity and abundance within the Project boundary, and inform understanding of roosting habitat, foraging range, and spatial distribution of federally listed Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*), and state listed Rafinesque's big-eared bats (*Corynorhinus rafinesquii*) and eastern small-footed bats (*Myotis leibii*). The goal was accomplished by completing surveys in accordance with the 2017 *Range-wide Indiana Bat Summer Survey Guidelines* (USFWS 2017), 2009 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 2009), and the most recent *Ohio Division of Wildlife Guidance for Bat Permitted Biologist* (ODNR-DOW 2017).

METHODOLOGY

Level of Effort/Site Selection

Mist-net surveys were implemented in accordance with guidelines outlined in the state and federal guidelines discussed above. The study plan was submitted to USWFS on 30 May 2017 and their approval to proceed was received on 31 May 2017. Additionally, ODNR was notified of the study plan on 30 May 2017 in accordance with permit requirements.

The level of effort outlined in the study plan was based on the estimated amount of forested habitat within the Study Area (~995 acres), resulting in 8 mist-net sites (72 net nights). Upon completion of the mist-net survey, the Project name was changed from Firelands to Emerson Creek North, and the boundary was adjusted to include an area to the south which was originally surveyed in 2017 for a separate project (Emerson Creek Wind Facility, USFWS Project No. 17-023). This boundary change resulted in two additional mist-net sites (EC21 and EC22) to be located within the updated Project boundary. This report includes the data for the 10 mist-net sites (90 net nights) located within the updated Project boundary surveyed from 19 June through 3 July 2017 (Figure 1).



COPPERHEAD ENVIRONMENTAL CONSULTING

Emerson Creek North

Mist-net Site Location Map



Huron and Erie Counties,
Ohio

! Mist-net Site-No Listed Captures
□ Project Boundary

Coordinate System:
NAD 1983 StatePlane
Ohio North FIPS 3401
Feet
Projection: Lambert
Conformal Conic
Datum: North
American 1983
Sources: Apex Clean
Energy, ESRI, USGS,
Copperhead
Consulting
Date: 9/15/2017

1:96,000
or
1 inch = 8,000 ft

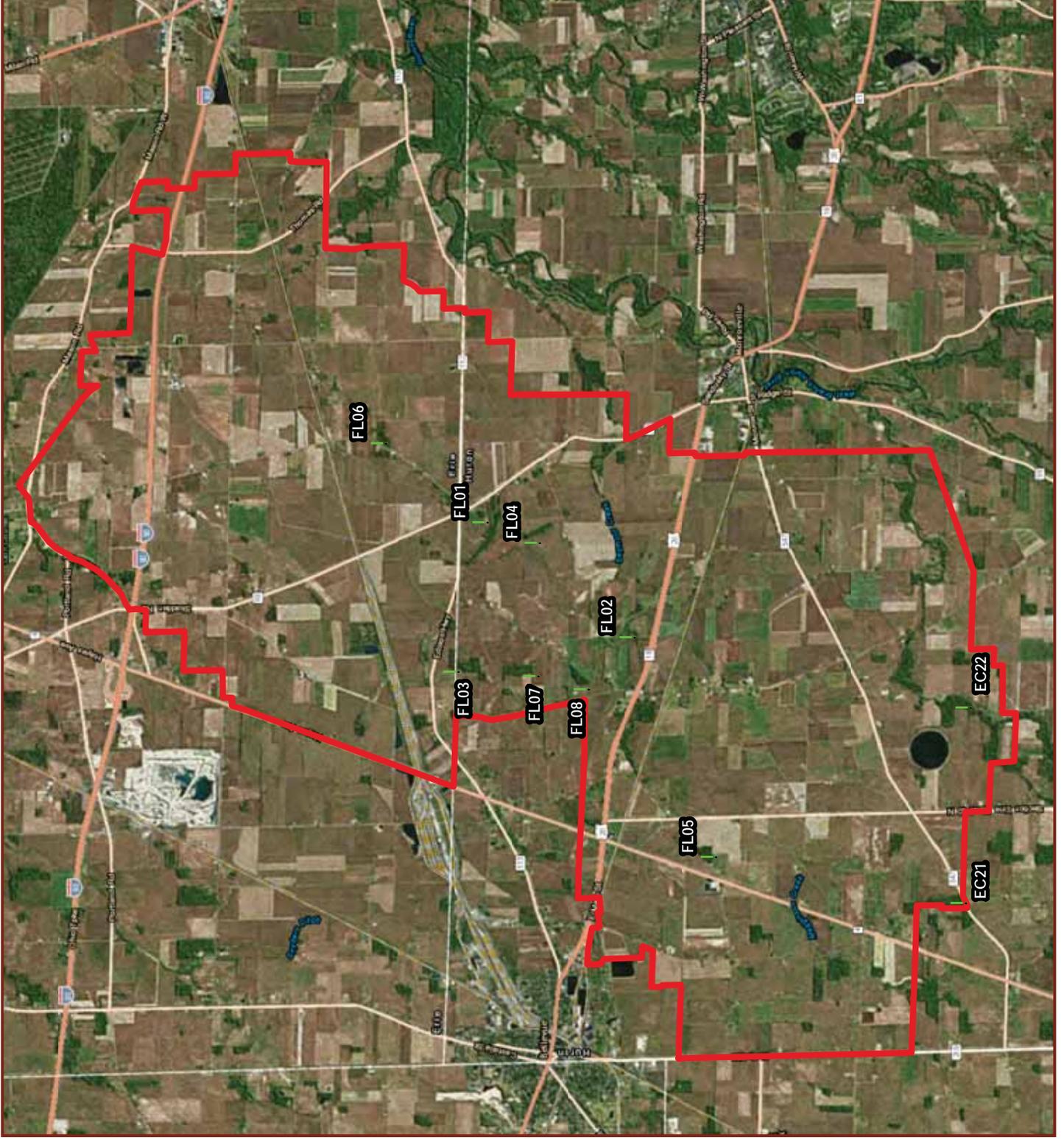
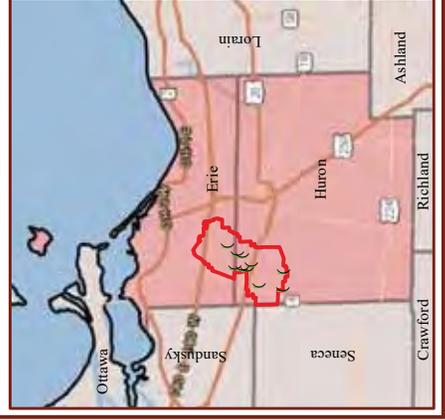
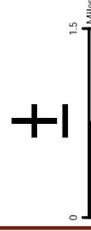


Figure 1. Proposed Emerson Creek North Wind Project area and bat survey mist-net sites, Erie and Huron Counties, Ohio, 2017.

Mist-Net Surveys

Mist-nets were set up to maximize coverage of flight paths used by bats along suitable travel corridors, foraging areas, or drinking areas. Placement of mist-nets was based on the extent of canopy cover, presence of an open flyway, and forest conditions near the site. Actual location and orientation of each net was determined in the field by permitted biologists and mapped with ArcGIS (v. 10.5 ESRI, Redlands, CA).

Each mist-net site consisted of three to four double-high net sets (two nets stacked; 5.2 meters tall) and one three high net set (three mist-nets stacked; 7.5 meters tall). Mist-net sites were surveyed for two nonconsecutive nights for a total of nine net nights per site.

Low visibility, high-quality, nylon nets, 4 to 12 meters (~13 - 42 feet) in length (depending upon the width of the corridor) were used for each net set. Nets were deployed at sunset each night, left open for at least five hours, and checked every 10 minutes. Disturbance near the nets was kept to a minimum between checks. Weather data, including temperature, wind speed, and cloud cover, were recorded for each site on an hourly basis to ensure compliance with the mist-netting guidelines (e.g., temperature during survey > 50°F).

Bats were live-caught and released unharmed near the point of capture. Data recorded for each individual included time of capture, capture net, capture height, species, sex, age class, reproductive condition, mass, and forearm length. Representative photographs were taken of each species captured at each mist-net site as state and federal protocols mandate (ODNR 2009, USFWS 2017). Processing of bats was completed within 30 minutes from the time the bat was removed from the net.

White-Nose Syndrome Protocol

To minimize the transmission of White-Nose Syndrome (WNS) between captured bats, all netting and field activities followed the most up-to-date guidelines established by USFWS (2016). All hard, non-porous netting equipment was sanitized with Isopropyl alcohol wipes (70%) prior to arrival at the project site and after each survey night; all other equipment was submersed in hot water (55°C) for a minimum of 20 minutes. Disposable latex gloves were worn over sanitized handling gloves and changed following the handling of each bat. All non-disposable equipment, e.g., PESOLA® scales, rulers, calipers, etc., coming into contact with bats was sanitized immediately following the handling of each bat. Bats were evaluated for potential WNS infection through wing scoring following the Wing-Damage Index (Reichard and Kunz 2009).

Radio-Telemetry & Emergence Counts

If federal or state-listed bats were captured, radio transmitters would be attached to individuals in order to locate day roosts, conduct emergence counts, and to estimate foraging ranges in accordance with state and federal protocols (ODNR 2009, USFWS 2017).

RESULTS AND DISCUSSION

Mist-Net Survey

Mist-net surveys were conducted at 10 sites from 19 June through 3 July 2017 (Table 1, Figure 1). A total of 58 bats of 3 species were captured, none of which were federally or state listed (Table 2). Big brown bats (*Eptesicus fuscus*) comprised 72 percent of total captures (n=42), eastern red bats (*Lasiurus borealis*) comprised 21 percent of total captures (n=12), and hoary bats (*Lasiurus cinereus*) comprised the remaining 7 percent of total captures. Completed bat capture data sheets are provided in Appendix A, photographs of mist-net sites are provided in Appendix B, and representative photographs of each bat species captured are provided in Appendix C.

Mist-netting surveys did not result in the capture of federally or state listed bats so subsequent radio-telemetry efforts were not conducted.

Table 1. Mist-net site locations, Emerson Creek North Wind Project, Erie and Huron Counties, Ohio, 2017.

Site Name	Latitude	Longitude	County	Site Location
FL01	41.28445	-82.72825	Huron	Small woodlot and Ag fields south of HWYs 113 and 99
FL02	41.26146	-82.75196	Huron	Megginson Creek and Ag fields south of Williams Rd
FL03	41.28894	-82.75920	Erie	Briar Oak Sporting Clays
FL04	41.27634	-82.73245	Huron	Woodlot between Ag field north of Mead Rd
FL05	41.24871	-82.79745	Huron	Small woodlot and Ag field east of Young Rd (HWY 4)
FL06	41.30038	-82.71198	Erie	Woodlot southeast of Patten Tract Rd
FL07	41.27648	-82.76006	Huron	ATV trails in woodlot east of Sandhill Rd
FL08	41.26862	-82.76289	Huron	Small woodlot surrounded by Ag fields
EC21	41.20970	-82.80673	Huron	Small woodlot north of 547, East of 4
EC22	41.20903	-82.76632	Huron	Frink Run creek

Table 2. Total bat captures by species, age, sex, and reproductive status, Emerson Creek North Wind Project, Erie and Huron Counties, Ohio, 2017.

Species	Adult				Juvenile		Unknown*	Total
	Male	Female			Male	Female		
	NR	L	PL	NR	NR	NR		
<i>Eptesicus fuscus</i>	26	8	7	1	0	0	0	42
<i>Lasiurus borealis</i>	3	4	2	0	1	1	1	12
<i>Lasiurus cinereus</i>	1	0	0	0	2	0	1	4
								58

NR=non-reproductive, L=lactating, PL=post-lactating

*Bat released or escaped before processing

CONCLUSIONS

No federally or state listed species were captured during this survey. Results of this survey suggest that the target species are either absent, or present in such low densities that they were not detected; therefore, risk of the project impacting these species during the summer maternity period (May 15 to Aug 15) is very low.

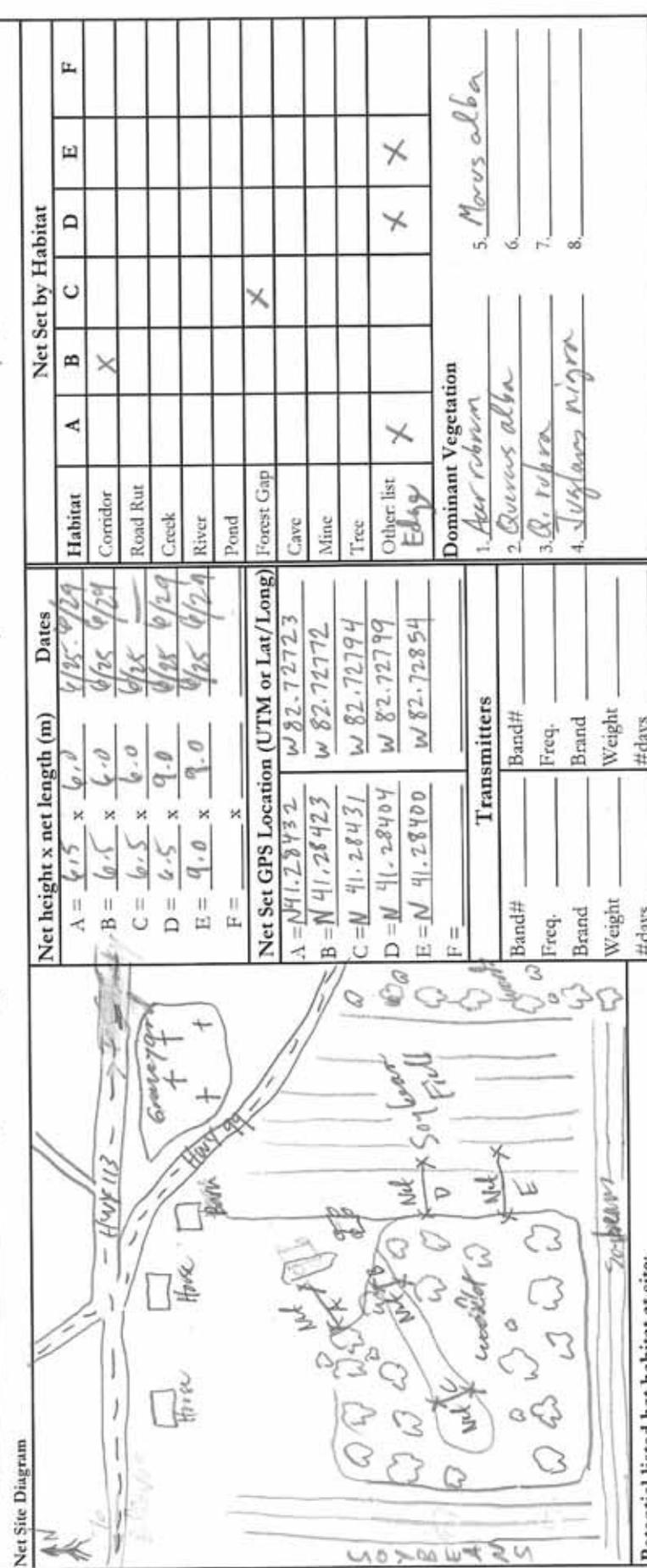
LITERATURE CITED

2016. National White-Nose Syndrome Decontamination Protocol, Version 04.12.2016.
https://www.whitenosesyndrome.org/sites/default/files/files/national_wns_decon_protocol_04.12.2016.pdf.
- Ohio Division of Natural Resources (ODNR). 2009. On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio: An Addendum to the Ohio Department of Natural Resource's Voluntary Cooperative Agreement.
- Ohio Division of Natural Resources – Division of Wildlife (ODNR-DOW). 2017. Ohio Division of Wildlife and USFWS (OH Field Office) Guidance for Bat Permitted Biologist.
- Reichard, J. D. and T. H. Kunz. 2009. White-nose syndrome inflicts lasting injuries to the wings of little brown myotis (*Myotis lucifugus*). *Acta Chiropterologica*, 11(2) 457-464.
- United States Fish and Wildlife Service (USFWS). 2017. Range-wide Indiana Bat Summer Survey Guidelines.

APPENDIX A

Mist-Net Data Sheets

Site No. F101 Project Phase# 590.02 Project Name Fishlands Apex Dates 25, 29 June 2014



Net height x net length (m)		Dates
A =	6.5 x 6.0	6/25-6/29
B =	6.5 x 6.0	6/25-6/29
C =	6.5 x 6.0	6/25-6/29
D =	6.5 x 9.0	6/25-6/29
E =	9.0 x 9.0	6/25-6/29
F =	x	

Net Set GPS Location (UTM or Lat/Long)	
A =	N 41.28432 W 82.72723
B =	N 41.28423 W 82.72772
C =	N 41.28431 W 82.72794
D =	N 41.28404 W 82.72799
E =	N 41.28400 W 82.72854
F =	

Transmitters	
Band#	
Freq.	
Brand	
Weight	
#days	

Potential listed bat habitat at site:

2. Roost habitat: 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

1. Water Resources: 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

1. Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2. Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. FL03 Project Phase# 590.02 Project Name Apex Firelands Dates 7/1/13
 Site Location Briarclark Sporting Clays Habitat Type *Bottomland Forest
 County Erie State OH Permittee Kate Baert Technician(s) Garrett Brough, J. Burns, W. Sciter
 Lat/Long or UTM (circle one): N/Easting 4128874 W/Northing -2275920 UTM Zone 18R Datum NAD 83



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments	Date	Time	Temp (°F)	Sky	Wind	Comments	Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
1	7/1	2215	EPFU	A	M	N	16.75	44	E	2.0	0				7/1	2108	77	0	0		7/1	56	0218	0138	0602	2108
2	7/1	2220	LABO	A	F		15.25		D	1.0				*	7/1	2208	71	0	0		7/1	60	1614	0237	0602	2107
3	7/1	2313	EPFU	A	M	N	15.25	46	C	1.5	0															
4	7/1	0004	LABO	A	F	L	14.75	43	E	1.0	0			Photos												
5	7/1	0030	EPFU	A	F	L	20	48	C	3.0	0			Small feces in field												
6	7/1	0120	EPFU	A	F	PL	19.5	45	E	2.0	0															
7	7/1	0145	EPFU	A	M	N	17.25	47	A	1.0	0															
1	7/3	2130	LABO	A	F	IL	14.25	43	A	0.5	0															
2	7/3	2345	EPFU	A	M	N	17.25	49	C	1.0	0															
3	7/3	0030	EPFU	A	M	N	17.75	48	C	1.5	0															
4	7/3	0045	EPFU	A	M	N	20.25	49	C	2.0	0															
5	7/3	0105	LABO	A	M	N	13.0	39	B	7.0	0															
6	7/3	0105	LABO	A	M	N	11.25	40	B	6.0	0															
7	7/3	0130	EPFU	A	M	N	18.25	46	C	1.5	0															
8	7/3	0150	LAC1	J	M	N	18.75	53	C	4.0	0															
9	7/3	0206	LAD0	A	F	PL	16.0	44	B	0.5	0															

Species Abbreviations: *Corynorhinus rafinesquii* (COR); *Corynorhinus t. virginianus* (COV); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus semihilus* (LASE); *Lasiurus noctivagus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctinomus phyllotis* (NYPH); *Peromyscus subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

***Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. FL03

Project Phase# 590.02 Project Name Apex Firelands Dates 7/1, 7/3

Net Site Diagram



Net height x net length (m)	Dates
A = 5.2 x 6	7/1, 7/3
B = 7.8 x 9	7/1, 7/3
C = 5.2 x 6	7/1, 7/3
D = 5.2 x 6	7/1
E = 5.2 x 6	7/1, 7/3
F = x	

Habitat	A	B	C	D	E	F
Corridor	✓	✓	✓	✓	✓	✓
Road Rut						
Creek						
River						
Pond						
Forest Gap						
Cave						
Mine						
Tree						
Other list						

Net Set GPS Location (UTM or Lat/Long)
A = 41.2894 - 82.75920
B = 41.28877 - 82.75700
C = 41.28838 - 82.75874
D = 41.28839 - 82.75923
E = 41.28831 - 82.75958
F =

Dominant Vegetation	5	6	7	8
1. <u>Quercus sp. / oaks</u>				
2. <u>Quercus bicolor</u>				
3. <u>Celtis occidentalis</u>				
4. _____				

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

Potential listed bat habitat at site:

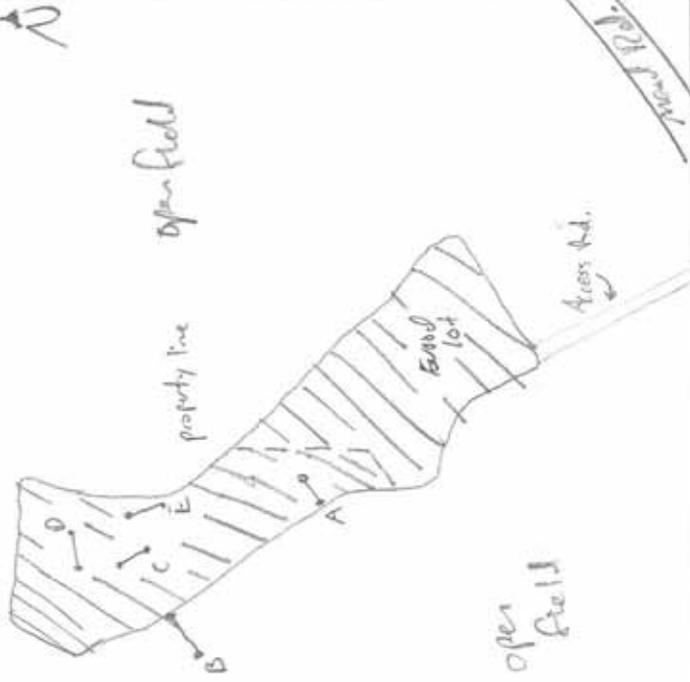
- Roost habitat: 1. Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.
- Water Resources: 1. Poor:** bat drinking resources not present at the site. **2. Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.
- Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1; poor). **1. Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
- Land Cover: 1. Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. **2. Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. **3. Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

* Could not finish processing due to injury on's hander (wiped membranes), 2 large holes in left wing

Site No. FLOY Project Phase# 590.02 Project Name Apex Firelands Dates 28 June 17 - 2 July 2017

Net Site Diagram



Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor	/					
Road Run						
Creek						
River						
Pond						
Forest Gap						
Cave						
Mine						
Tree						
Other list						

Net height x net length (m)		Dates
A =	5.2 x 4.0	28 June, 28 July
B =	7.8 x 7.0	28 June, 28 July
C =	5.2 x 7.0	28 June, 28 July
D =	5.2 x 6.0	28 June, 28 July
E =	5.2 x 6.0	28 June, 28 July
F =	x	

Net Set GPS Location (UTM or Lat/Long)	
A =	41.27634 -82.73245
B =	41.27702 -82.73306
C =	41.27721 -82.73287
D =	41.27717 -82.73287
E =	41.27732 -82.73218
F =	

Transmitters	
Band#	
Freq.	
Brand	
Weight	
#days	

Dominant Vegetation
 1. Coryca ovata
 2. Quercus velutina
 3. Quercus alba
 4. Alyssa sylvatica
 5. _____
 6. _____
 7. _____
 8. _____

Potential listed bat habitat at site:

2. Roost habitat: **1. Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

1. Water Resources: **1. Poor:** bat drinking resources not present at the site. **2. Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal:** Streams or ponds (including road runs) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

3. Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
1. Poor: Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

1. Land Cover: **1. Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
2. Moderate: Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
3. Optimal: Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. FA05 Project Phase# 590.02 Project Name Friedrich Apex Dates 27 Nov 2017-01 Dec 2017
 Site Location Small NW 1/4 and Ag F-146 East of Young Rd. (MNH) Habitat Type* Bottomland Forest/Field
 County Huron State OH Permittee J. Hopkins Technician(s) A. W. Cole Datum NCS 84
 Lat/Lon or UTM (circle one): (N/Easting 41248710 -W/Northing 82797450 -W) UTM Zone



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments
	6/27	No	Bats	Captured										
1	7/1	6:35	LABD	M	A		14.0	40	B	2.5	0			
2	7/1	2:45	LACE	M	G		27.5	55	B	2.5	0			
3	7/1	01:20	LACE	M	J		22.3	54	A	3.5	0			
4	7/1	01:40	EPFB	M	A		18.0	45	D	3.5	0			
	6/27	2:00												Temp 67
	6/27	2:20												Temp 64
	6/27	2:30												Temp 61.8
	6/27	2:40												Temp 57.3
	6/27	2:50												Temp 57.3
	7/1	2:00												Temp 71.0
	7/1	2:30												Temp 72.0
	7/1	2:50												Temp 68.0
	7/1	3:00												Temp 66.5
	7/1	3:10												Temp 63.7

Date	Time	Temp (°F)	Sky	Wind	Comments
6/27	2:00	67	1	3	
6/27	2:20	64	1	2	
6/27	2:30	61.8	1	2	
6/27	2:40	57.3	1	2	
6/27	2:50	57.3	1	2	
7/1	2:00	71.0	1	1	
7/1	2:30	72.0	1	1	
7/1	2:50	68.0	0	1	
7/1	3:00	66.5	0	1	
7/1	3:10	63.7	1	1	

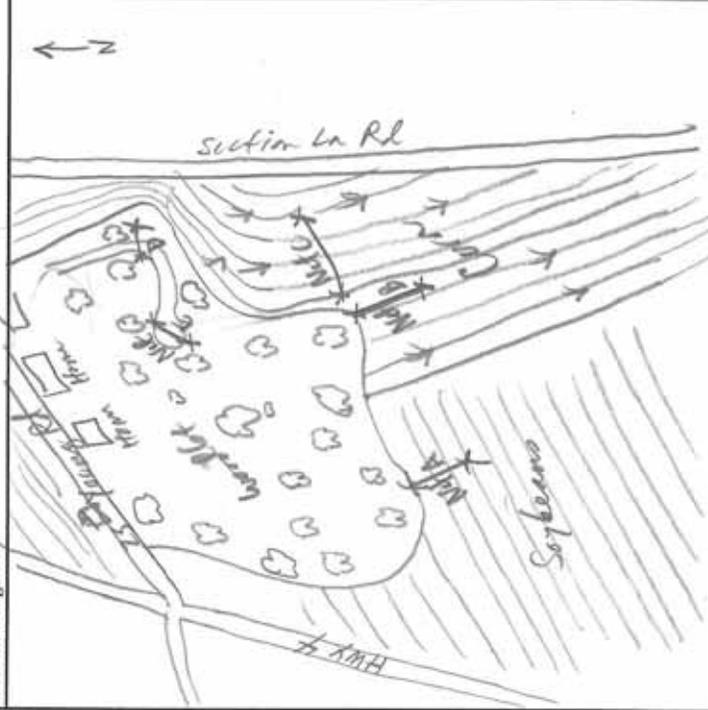
Sky Code	Beaufort Wind Scale
0 Clear	0 Calm: <1 mph
1 Few Clouds	1 Light air: 1-3 mph
2 Partly Cloudy	2 Light breeze: 4-6 mph
3 Cloudy or overcast	3 Gentle breeze: 7-10 mph
4 Fog or smog	4 Moderate breeze: 11-16 mph
5 Drizzle or light rain	
6 Heavy rain - thunder storm	

Species Abbreviations: *Corynorhinus virginianus* (COVA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasiurus noctivagus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius inornatus* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)
 Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
 * Habitat Type: Creek/aparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. F05
 Net Site Diagram

Project/Phase# Sgo.02 Project Name Ferland Apex

Dates 27 June, 1 July 2017



Net height x net length (m)	Dates
A = 6.5 x 9.0	6/27, 7/1
B = 6.5 x 9.0	6/27, 7/1
C = 9.0 x 9.0	6/27, 7/1
D = 6.5 x 4.0	6/27, 7/1
E = 6.5 x 4.0	6/27
F = x	

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor				X		
Road/Rut						
Creek						
River						
Pond						
Forest Gap					X	
Cave						
Mine						
Tree						
Other: list						
<u>Edge</u>	X	X	X			

Net Set GPS Location (UTM or Lat/Long)
A = N 41.24824
B = N 41.24823
C = N 41.24828
D = N 41.24876
E = N 41.24893
F =

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

Dominant Vegetation	
1. <u>Carpe arvensis</u>	5. <u>Morus alba</u>
2. <u>Quercus rubra</u>	6. <u>Centaurea sp.</u>
3. <u>Corypha glabra</u>	7. <u>Acer rubrum</u>
4. <u>Fragaria pennsylvanica</u>	8.

Potential listed bat habitat at site:

2. Roost habitat: 1. Poor: No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. Moderate: Snags with sloughing bark or other roost features present ~15 inch DBH within 1000 feet of forested areas. 3. Optimal: Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

1. Water Resources: 1. Poor: bat drinking resources not present at the site. 2. Moderate: Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. Optimal: Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

3. Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. Poor: Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. Moderate: some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. Optimal: Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2. Land Cover: 1. Poor: Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. Moderate: Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. Optimal: Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. FL06 Project Phase# 590 Project Name Apex Fire land Dates 29 June 2017, 1 July 2017

Net Site Diagram



Net height x net length (m)	Dates
A = 5.2 x 9	6/29
B = 7.8 x 9	6/29, 7/1
C = 5.2 x 7	6/29, 7/1
D = 5.2 x 6	6/29, 7/1
E = 5.2 x 6	6/29, 7/1
F = x	

Net Set GPS Location (UTM or Lat/Long)
A = 41,30034 -82.71136
B = 41,30043 -82.71165
C = 41,30017 -82.71212
D = 41,30034 -82.71198
E = 41,30041 -82.71254
F =

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor						
Road Rut						
Creek						
River						
Pond						
Forest Gap	X	X	X	X	X	X
Cave						
Mine						
Tree						
Other: list						

Dominant Vegetation
 1. Carya Ovata
 2. Acer Saccharum
 3. Pinus serotina
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____

Potential listed bat habitat at site:

- Roost habitat** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.
- Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.
- Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understorey growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understorey clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
- Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: Forest dominated by Carya Ovata

Site No. FLOZ Project Phase# 590.02 Project Name APPZ Finland Dates July 2008-31 July 2017
 Site Location ATV trail in water east of Sandhill Rd Habitat Type* Bottomland marsh
 County HUMPH State OH Permittee T. Gilbertson Technician(s) K. Dreyer, Daniel Beale
 Lat/Long or UTM (circle one): N/Easting 41, 27048 (W/Northing 82, 36006) UTM Zone 18NRS



COPPERHEAD
 ENVIRONMENTAL CONSULTING

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Type	Freq.	Comments
1	15 July	2145	LABO	A	F	PL	15.5	48	A	3	0				
2	15 July	2248	EPTU	A	M	NR	18.0	48	D	2.5	0				
3	15 July	2250	EPTU	A	M	NR	17.0	47	E	3	0				
4	15 July	2230	EPTU	A	M	NR	16.0	48	E	3.5	0				
5	15 July	0001	EPTU	A	M	NR	17.5	48	A	3.5	0				
6	15 July	0005	EPTU	A	F	PL	22.5	52	F	7	0				
7	15 July	0155	EPTU	A	M	NR	18.0	49	F	7	0				
8	15 July	0155	EPTU	A	M	NR	17.5	48	E	5	0				
1	3 July	2310	LABO	A	F	L	15.0	40	C	4.5	0-F				
2	3 July	2310	LABO	J	F	NR	9.0	40	A	2.5	0				
3	3 July	0001	EPTU	A	M	NR	17.5	47	C	5	0				
4	3 July	0030	EPTU	A	M	NR	17.8	48	E	6	0				

Date	Moon %	Moon rise	Moon set	Sunrise	Sunset
15 July	56	1418	0207	0600	2108
3 July	65	1915	0108	0604	2108

Date	Time	Temp (°F)	Sky	Wind	Comments
15 July	2108	74	0	0	
	2208	72	0	0	
	2208	70	0	1	
	2208	69	0	1	
	0108	69	0	0	
	0208	68	0	1	
3 July	2108	70	1	0	
	2208	69	1	0	
	2308	68	1	0	
	0008	68	2	0	
	0108	67	3	0	
	0204	67	3	0	

Sky Code	Beaufort Wind Scale
0 Clear	0 Calm < 1 mph
1 Few Clouds	1 Light air: 1-3 mph
2 Partly Cloudy	2 Light breeze: 4-6 mph
3 Cloudy or overcast	3 Gentle breeze: 7-10 mph
4 Fog or smoke	4 Moderate breeze: 11-16 mph
5 Drizzle or light rain	
6 Heavy rain - thunder storm	

Species Abbreviations: *Caryaculus nifinequid* (CORV); *Caryaculus t. virginianus* (COV); *Eptesicus fuscus* (EPTU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus teminckii* (LASE); *Lasiurus noctivagus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis kelii* (MYKE); *Myotis lasiopus* (MYLU); *Myotis septentrionalis* (MYSSE); *Myotis sodalis* (MYSO); *Nyctinomus humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Not Repro: N; Unknown: U

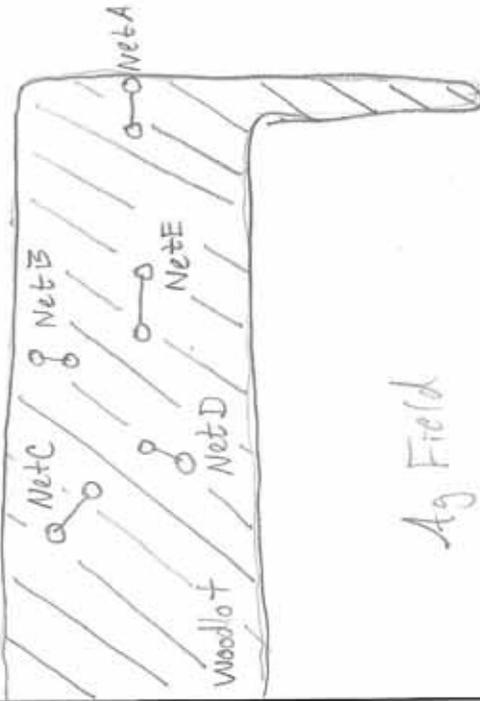
*Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. FLO7

Project Phase# S90.02 Project Name APEx Fireland

Dates 1 July 2017, 3 July 2017

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat								
A	B	C	D	E	F	A	B	C	D	E	F
5.2 x 12	5.2 x 4	1 July, 3 July					X			X	
5.2 x 9	5.2 x 6	1 July, 3 July									
7.8 x 9		1 July, 3 July									

Net Set GPS Location (UTM or Lat/Long)	
A = 41.27644	-82.76006
B = 41.27779	-82.75929
C = 41.27805	-82.75958
D = 41.27784	-82.75987
E = 41.27734	-82.76037
F =	

Transmitters	
Band#	
Freq.	
Brand	
Weight	
#days	

Dominant Vegetation	
1.	<u>Acer subrum</u>
2.	<u>Populus tremuloides</u>
3.	<u>Quercus velutina</u>
4.	<u>Celtis occidentalis</u>
5.	
6.	
7.	
8.	

Potential listed bat habitat at site:

2 Roost habitat: 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

1 Water Resources: 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road runs) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

2 Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

1 Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. FL08

Project Phase# 590.02 Project Name Fireland Apex

Dates 6/28, 7/2/2017

Net Site Diagram



Net height x net length (m)		Dates
A =	6.5 x 9.0	6/28, 7/2
B =	6.5 x 9.0	6/28
C =	6.5 x 6.0	4/28, 7/2
D =	6.5 x 9.0	6/28, 7/2
E =	9.0 x 9.0	6/28, 7/2
F =	x	

Net Set GPS Location (UTM or Lat/Long)	
A =	N41.26880 W82.76314
B =	N41.26896 W82.76319
C =	N41.26896 W82.76295
D =	N41.26900 W82.76286
E =	N41.26933 W82.76224
F =	

Transmitters	
Band#	
Freq.	
Brand	
Weight	
#days	

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor						
Road Rut						
Creek						
River						
Pond						
Forest Gap			X			
Cave						
Mine						
Tree						
Other: list	X	X				
Edge					X	

Dominant Vegetation

1. Corymbia
2. Carya ovata
3. Quercus rubra
4. Quercus velutina
5. _____
6. _____
7. _____
8. _____

Potential listed bat habitat at site:

Roost habitat: 1. **Poor:** No or few snags >= ~5' DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.

Water Resources: 1. **Poor:** bar drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).

1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.

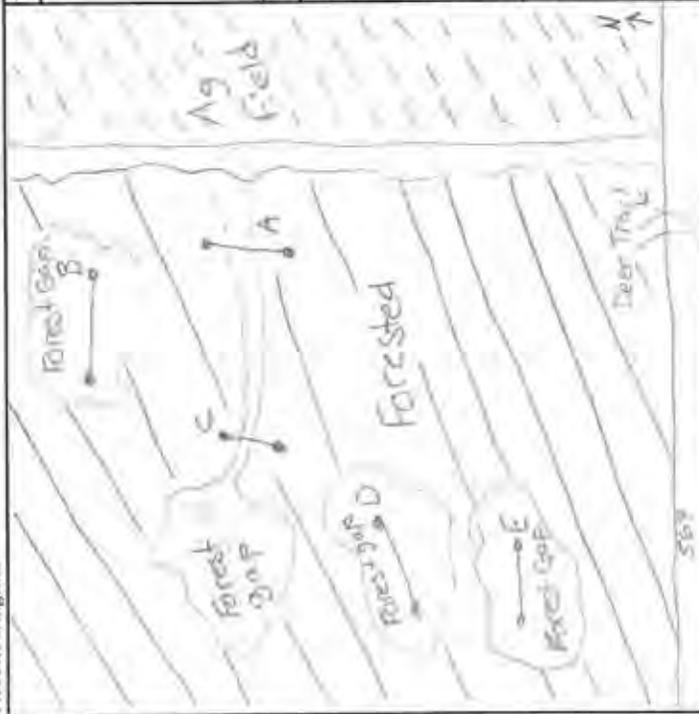
2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.

3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. LC21 Project Phase# 591.02 Project Name April Emerson Creev Dates 6/21, 6/23, 6/29

Net Site Diagram



Net height x net length (m)	Dates
A = 7.2 x 9	6/22, 6/23, 6/29
B = 5.2 x 1.2	6/23, 6/29
C = 5.2 x 6	6/22, 6/23, 6/29
D = 5.2 x 1.2	6/22, 6/23, 6/29
E = 5.2 x 9	6/22, 6/23, 6/29
F = *	

Net Set GPS Location (UTM or Lat/Long)
A = 41.20970 -82.80673
B = 41.20987 -82.80698
C = 41.20965 -82.80718
D = 41.20953 -82.80730
E = 41.20941 -82.80930
F =

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor						
Road Rut						
Creek						
River						
Pond						
Forest Gap	✓	✓	✓	✓	✓	✓
Cave						
Mine						
Tree						
Other list						

Dominant Vegetation

1. *Carya, Quercus*
2. *Quercus velutina*
3. *Ulmus rubra*
4. _____
5. _____
6. _____
7. _____
8. _____

Potential listed bar habitat at site:

2 **Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

1 **Water Resources:** 1. **Poor:** bar drinking resources not present at the site. 2. **Moderate:** Epithermal or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

2 **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2 **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.

3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: Temp: 67, Sky: 1, Wind: 2, Temp: 68, Sky: 2, Wind: 2
 6/29 0009 Weather 6/29 0208 Weather 6/29 0230 Weather
 Temp: 67, Sky: 1, Wind: 2 Temp: 68, Sky: 2, Wind: 2

Site No. EC 22 Project, Phase# 591.02 Project Name Apex Emerson Creek Dates 19 + 24 June 2017
 Site Location Frink Run Creek Habitat Type* Creek/riparian
 County Holt State OH Permittee G. Jones Technician(s) M. Seiter, Molly Gooden
 Lat/Long or UTM (circle one): N/Easting 4120903 (W/Northing 6276632) UTM Zone 18Q Datum NAD 83



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Type	Freq.	Comments	Date	Time	Temp (°F)	Sky	Wind	Comments	Date	Time	Temp (°F)	Sky	Wind	Comments	Moon rise	Moon set	Sunrise	Sunset		
1	6/19	2155	EPPU	A	M	NR	16.5	43.0	B	3.0	0-0					6/19	2108	64	1	3	NA	6/19	0249	61	1	2	1556	0557	0557	2106			
2	6/19	2215	EPPU	A	F	L	20.0	49.0	B	2.0	0					6/19	2206	61	1	2	NA	6/19	0642	61	1	2	2142	0554	0554	2107			
3	6/19	2236	EPPU	A	M	NR	15.0	45.0	B	3.5	0					6/19	0006	57	1	2	NA												
4	6/19	2245	LABO	A	F	L	15.0	42.5	B	2.5	0					6/19	0106	55	1	2	NA												
5	6/19	2335	EPPU	A	F	L	21.0	49.0	D	4.0	0					6/19	0206	55	1	2	NA												
1	6/24	2235	EPPU	A	F	L	24.75	47.0	A	1.5	0					6/24	2107	63	1	0	NA												
2	6/24	2350	EPPU	A	F	L	21.25	48.0	A	2.5	0					6/24	2307	59	0	0	NA												
3	6/24	0000	EPPU	A	F	NR	18.50	45.0	B	3.0	0					6/24	2307	59	0	0	NA												
4	6/24	0000	EPPU	A	M	NR	16.50	48.0	A	2.0	0					6/24	0007	59	2	0	NA												
																6/24	0107	55	2	0	NA												
																6/24	0207	57	3	0	NA												

Sky Code	
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale	
0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPPU); *Lasius borealis* (LABO); *Lasius cinereus* (LACI); *Lasius seminolus* (LASL); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius borealis* (NYHU); *Perimyotis indiflavus* (PEIS); *Tadarida brasiliensis* (TABB)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

*Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. EC 22 Project Phase# 511.02 Project Name Apex Emission Creek Dates 19 Jul 24 Jun 2011

Net Site Diagram



Net height x net length (m)	Dates
A = 3.2 x 9	19 Jul 24 Jun
B = 2.8 x 9	19 Jul 24 Jun
C = 3.2 x 6	19 Jul 24 Jun
D = 5.2 x 12	19 Jun
E = 5.2 x 9	19 Jul 24 Jun
F = x	

Net Set GPS Location (UTM or Lat/Long)
A = 41,20907 -82,76798
B = 41,20884 -82,76707
C = 41,20837 -82,76694
D = 41,20903 -82,76632
E = 41,20926 -82,76632
F =

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor	X	X		X		
Road Rut						
Creek			X		X	
River						
Pond						
Forest Gap						
Cave						
Mine						
Tree						
Other: list						

Dominant Vegetation
 1. *J. Nigra*
 2. *A. Saccharinum*
 3. *P. D. Indica*
 4. *A. Negundo*
 5. _____
 6. _____
 7. _____
 8. _____

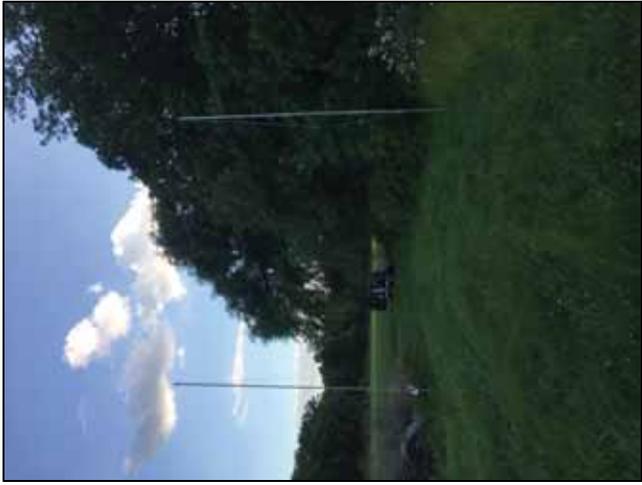
Potential listed bat habitat at site:

- Roost habitat:**
 - 1. Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc)
 - 2. Moderate:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.
 - 3. Optimal:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.
- Water Resources:**
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- Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
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 - 2. Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare.
 - 3. Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
- Land Cover:**
 - 1. Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 - 2. Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 - 3. Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

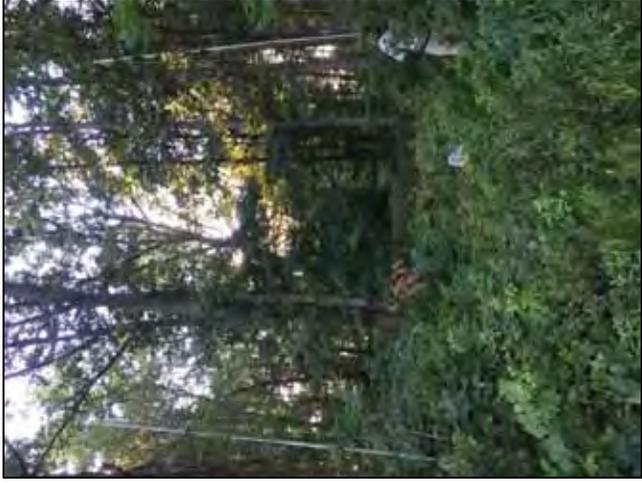
Comments:

APPENDIX B

Mist-Net Site Photographs



Site FL01 Net A



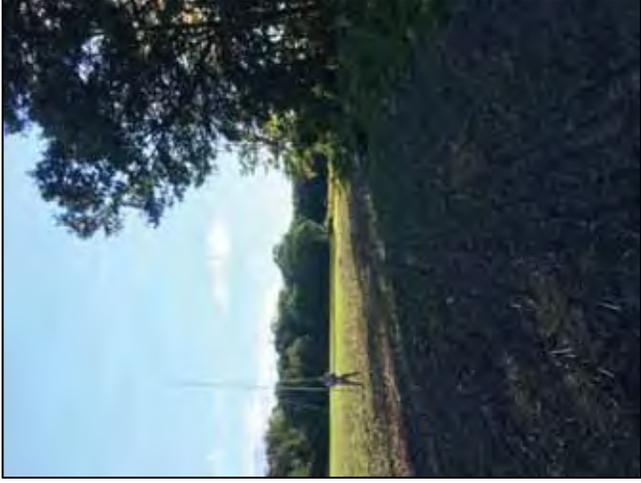
Site FL01 Net B



Site FL01 Net C



Site FL01 Net D



Site FL01 Net E



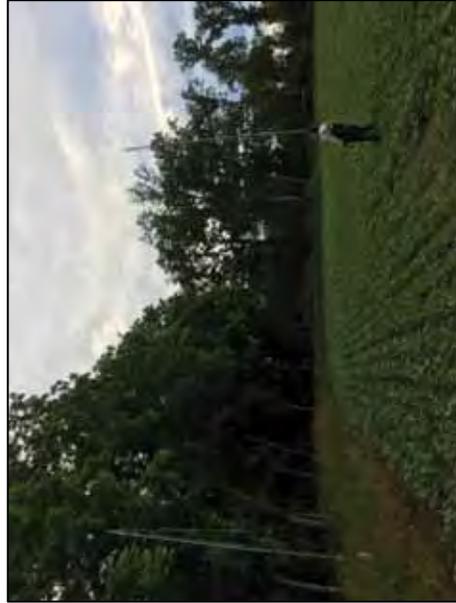
Site FL02 Net A



Site FL02 Net B



Site FL02 Net C



Site FL02 Net D



Site FL02 Net E



Site FL03 Net A



Site FL03 Net B



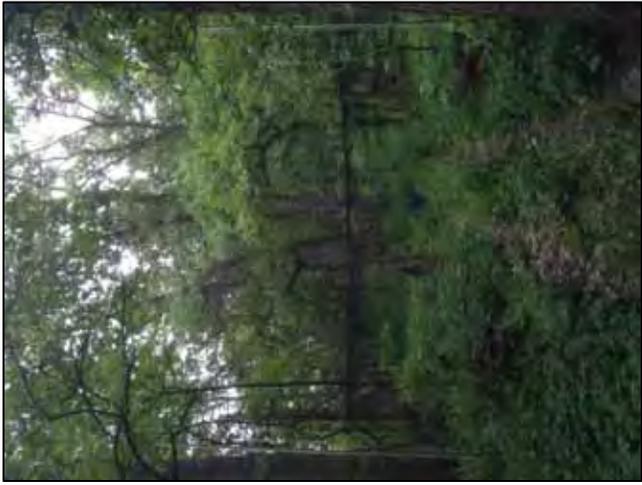
Site FL03 Net C



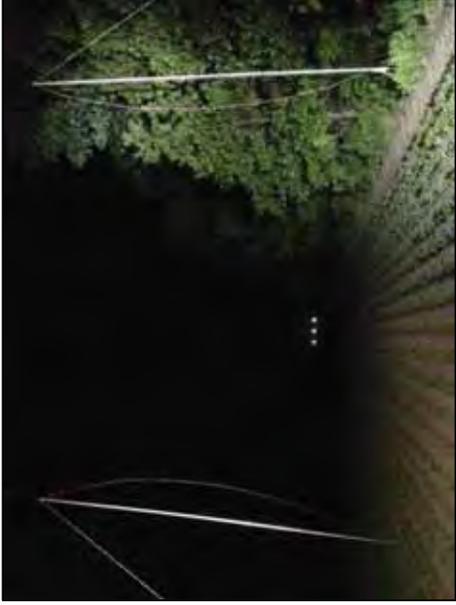
Site FL03 Net D



Site FL03 Net E



Site FL04 Net A



Site FL04 Net B



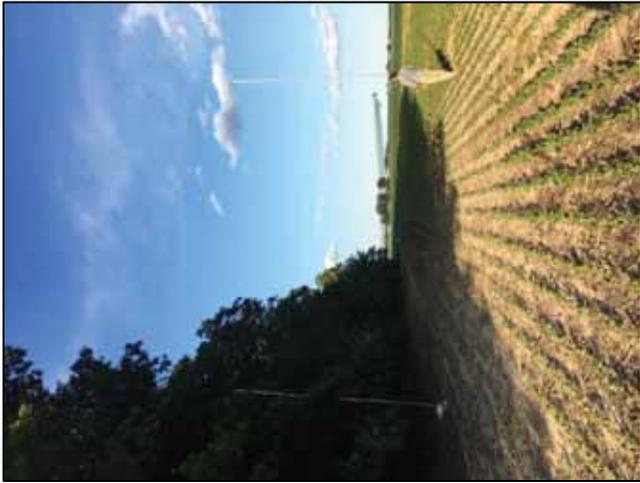
Site FL04 Net C



Site FL04 Net D



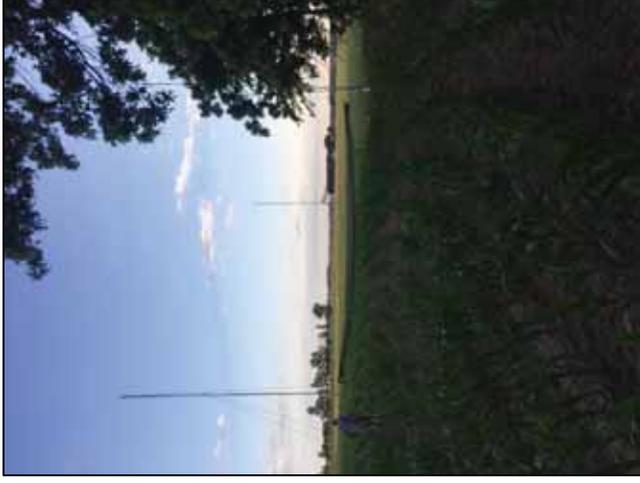
Site FL04 Net E



Site FL05 Net A



Site FL05 Net B



Site FL05 Net C



Site FL05 Net D



Site FL05 Net E



Site FL06 Net A



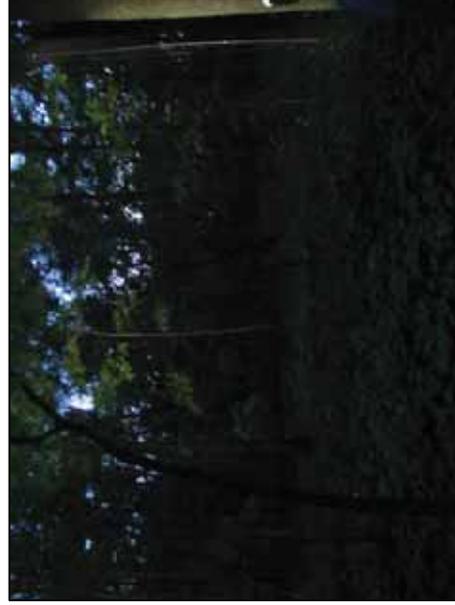
Site FL06 Net B



Site FL06 Net C



Site FL06 Net D



Site FL06 Net E



Site FL07 Net A



Site FL07 Net B



Site FL07 Net C



Site FL07 Net D



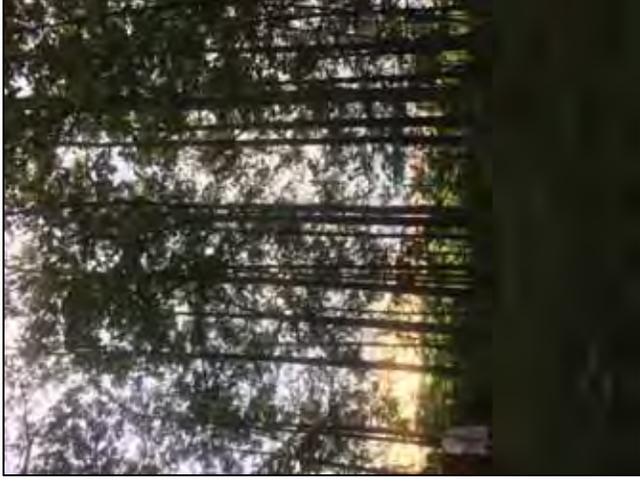
Site FL07 Net E



Site FL08 Net A



Site FL08 Net B



Site FL08 Net C



Site FL08 Net D



Site FL08 Net E



Site EC21 Net A



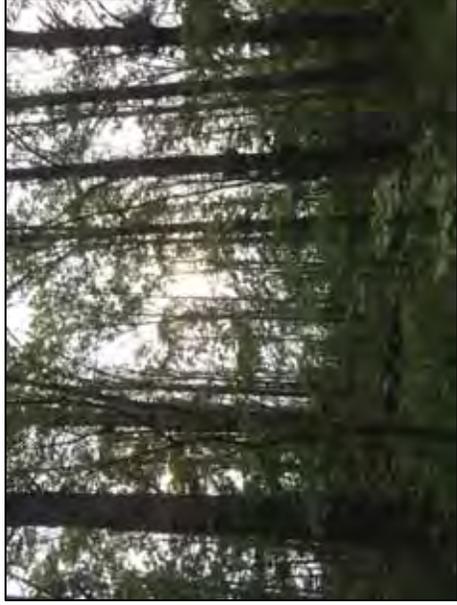
Site EC21 Net B



Site EC21 Net C



Site EC21 Net D



Site EC21 Net E



Site EC22 Net A



Site EC22 Net B



Site EC22 Net C



Site EC22 Net D



Site EC22 Net E

APPENDIX C

Bat Capture Photographs



Big Brown Bat (*Eptesicus fuscus*)



Eastern Red Bat (*Lasiurus borealis*)



Hoary Bat (*Lasiurus cinereus*)

Exhibit Y

Bat Mist-Netting Reports

3. 2017 Emerson Creek Wind Project Bat Mist Netting Survey Report, Huron County, Ohio dated December 4, 2017

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todonnell@dickinsonwright.com
wvorys@dickinsonwright.com

Attorneys for Firelands Wind, LLC



Final Report

2017 Emerson Creek Wind Project Bat Mist Netting Survey Report, Huron County, Ohio

USFWS No. 17-023

Completed by:

Zachary Baer, Theresa Wetzel, Piper Roby, Chris McNees, and Chris Leftwich

4 December 2017

COPPERHEAD ENVIRONMENTAL CONSULTING, INC.
P.O. BOX 73 ■ 471 MAIN STREET ■ PAINT LICK, KENTUCKY 40461
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www.copperheadconsulting.com

Business Confidential – Not for Public Disclosure

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- Appendix A: Mist-Net Data Sheets
- Appendix B: Mist-Net Photographs
- Appendix C: Bat Capture Photographs

PROJECT BACKGROUND

Copperhead Environmental Consulting, Inc. (Copperhead) completed a bat mist-net and telemetry survey for the proposed Emerson Creek Wind Project (Project) in Huron County, Ohio (Figure 1). The goals of this survey were to document bat species diversity and abundance within the Project boundary, and inform understanding of roosting habitat, foraging range, and spatial distribution of federally listed Indiana bats (*Myotis sodalis*) and northern long-eared bats (*Myotis septentrionalis*), and state listed Rafinesque's big-eared bats (*Corynorhinus rafinesquii*) and eastern small-footed bats (*Myotis leibii*). The goals were accomplished by completing surveys in accordance with the 2017 *Range-wide Indiana Bat Summer Survey Guidelines* (USFWS 2017), 2009 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 2009), and the most recent *Ohio Division of Wildlife Guidance for Bat Permitted Biologist* (ODNR-DOW 2017).

METHODOLOGY

Level of Effort/Site Selection

Mist-net surveys were implemented in accordance with guidelines outlined in the state and federal guidelines discussed above. The study plan was submitted to USFWS on 30 May 2017 and USFWS concurrence was received on 31 May 2017. Additionally, ODNR was notified of the study plan on 30 May 2017 in accordance with permit requirements.

The level of effort outlined in the study plan was based on the estimated amount of forested habitat within the Study Area (~4,560 acres), resulting in 37 mist-net sites (333 net nights). Upon completion of the mist-net survey, the northern Project boundary was adjusted, resulting in two mist-net sites (EC21 and EC22) being located outside of the updated Project boundary. This report includes the data for the 35 mist-net sites (315 net nights) located within the updated Project boundary surveyed from 19 June through 3 July 2017 (Figure 1).



COPPERHEAD
ENVIRONMENTAL CONSULTING

Emerson Creek Mist-net Site Location Map



Huron County,
Ohio

- Mist-net Site-No Listed Captures
- Mist-net Site-MYSO Capture Site
- Project Boundary

Coordinate System:
NAD 1983 StatePlane
Ohio North FIPS 3401
Feet
Projection: Lambert
Conformal Conic
Datum: North
American 1983
Sources: Apex Clean
Energy, ESRI, USGS,
Copperhead
Consulting
Date: 9/15/2017

1:105,000
or
1 inch = 8,750 ft

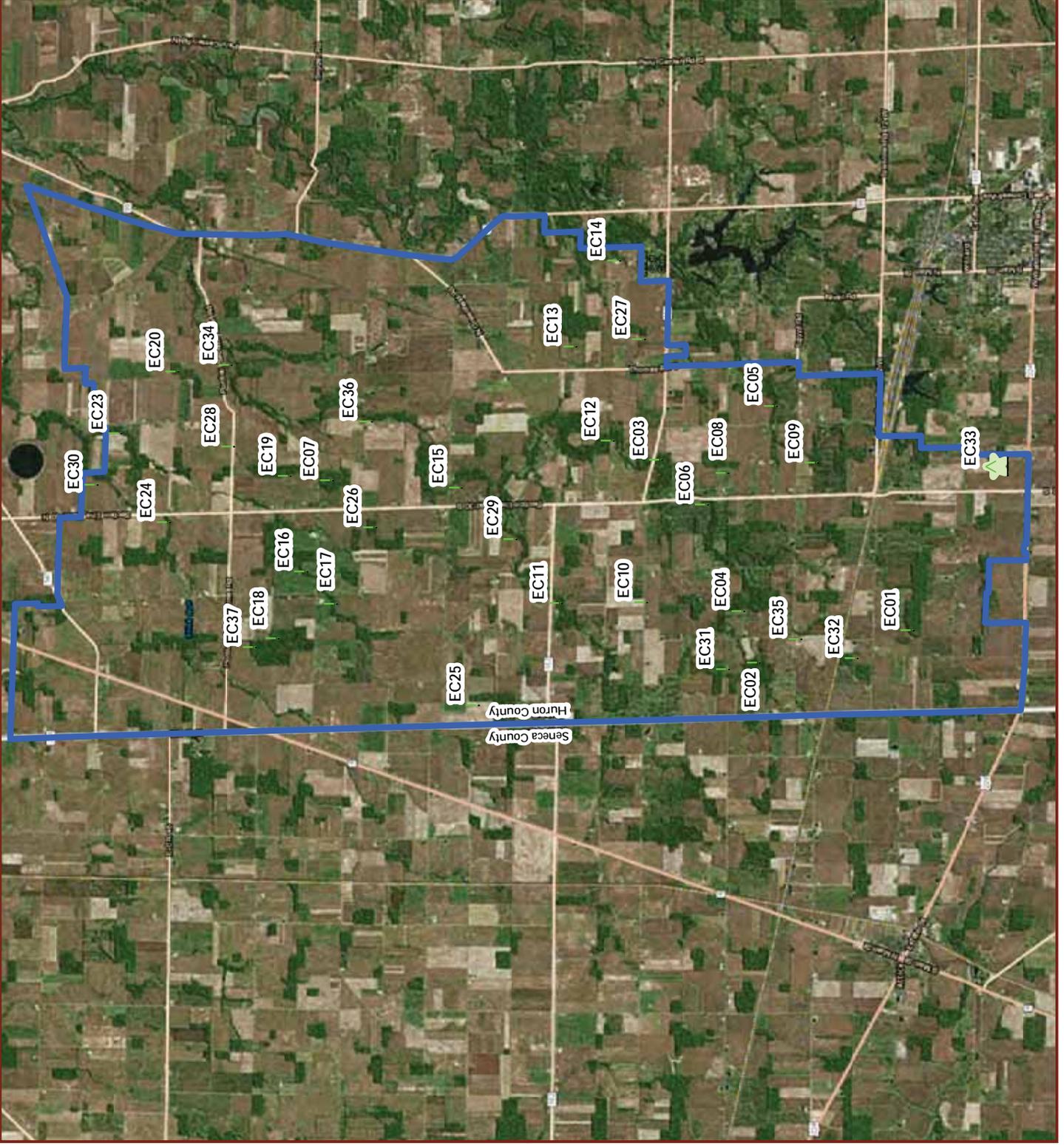
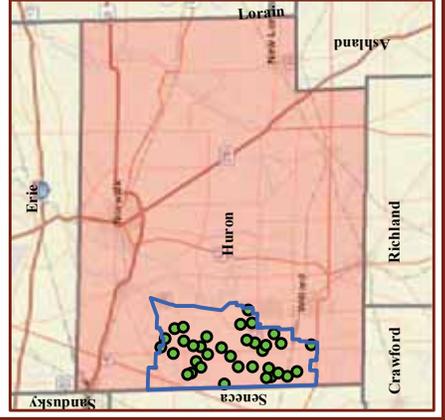


Figure 1. Proposed Emerson Creek Wind Project and bat survey mist-net sites, Huron County, Ohio, 2017.

Mist-Net Surveys

Mist-nets were set up to maximize coverage of flight paths used by bats along suitable travel corridors, foraging areas, or drinking areas. Placement of mist-nets was based on the extent of canopy cover, presence of an open flyway, and forest conditions near the site. Actual location and orientation of each net was determined in the field by permitted biologists and mapped with ArcGIS (v. 10.5 ESRI, Redlands, CA).

Each mist-net site consisted of five net sets, with at least one net set comprised of a three-high net (three mist-nets stacked; 7.5 meters tall). Mist-net sites were surveyed for two nonconsecutive nights (five net nights the first night, four net nights the second night) for a total of nine net nights per site.

Low visibility, high-quality, nylon nets, 4 to 18 meters (~13 - 59 feet) in length (depending upon the width of the corridor) were used for each net set. Nets were deployed at sunset each night, left open for at least five hours, and checked every 10 minutes. Disturbance near the nets was kept to a minimum between checks. Weather data, including temperature, wind speed, and cloud cover, were recorded for each site on an hourly basis to ensure compliance with the mist-netting guidelines (e.g., temperature during survey > 50°F).

Bats were live-caught in mist-nets and released unharmed near the point of capture. Data recorded for each captured individual included time of capture, capture net, capture height, species, sex, age class, reproductive condition, mass, and forearm length. Representative photographs were taken of each species captured at each mist-net site per state and federal protocols (ODNR 2009, USFWS 2017). Processing of bats was completed within 30 minutes from the time the bat was removed from the net. Captured target species were banded utilizing ODNR, Division of Wildlife (DOW) bands as required by ODNR and OH USFWS.

White-Nose Syndrome Protocol

To minimize the transmission of White-Nose Syndrome (WNS) between captured bats, all netting and field activities followed the most up-to-date guidelines established by USFWS. All hard, non-porous netting equipment was sanitized with Isopropyl alcohol wipes (70%) prior to arrival at the project site and after each survey night; all other equipment was submersed in hot water (55°C) for a minimum of 20 minutes. Disposable latex gloves were worn over sanitized handling gloves and changed following the handling of each bat. All non-disposable equipment (e.g., PESOLA® scales, rulers, calipers, etc.) coming into contact with bats was sanitized immediately following the handling of each bat. Bats were evaluated for potential WNS infection through wing scoring following the Wing-Damage Index (Reichard and Kunz 2009).

Radio Telemetry

Radio Transmitter Attachment

Captured target species were radio-tagged to locate diurnal roosts and to collect foraging data. Radio transmitters (Lotek PicoPip Ag337, 172 kHz, 0.3g) were tested before being attached between the scapulae of the bat with Perma-Type (The Perma-Type Company, Inc., Plainville, CT), a nontoxic surgical adhesive that degrades over time, allowing the transmitter to fall off the bat. Each transmitter had a unique frequency, which was used to identify individual bats during radio tracking.

Diurnal Radio Telemetry & Emergence Counts

Ground triangulation and aerial radio telemetry techniques were used to track radio-tagged bats to their estimated day roost locations. Ground tracking was completed using model TRX-1000S (Wildlife Materials Inc., Carbondale, IL) tracking receivers and 172-3FB 3- and 5-element Yagi directional antennas. Aerial tracking was completed using a Cessna Sky Hawk 172 fitted with aircraft strut mount assemblies (Advanced Telemetry Systems Inc., [ATS] 1997, Isanti, MN) with two 172-3FB 4-element ATS Yagi directional antennas (ATS model #13886). Estimated roost locations were mapped with ArcGIS (v. 10.5 ESRI, Redlands, CA).

If day roosts were located on the ground, and property access was granted, emergence counts would have been completed in accordance with state and federal protocols (ODNR 2009, USFWS 2017).

Foraging Telemetry

Foraging telemetry was completed using the Cessna Sky Hawk 172 fitted for aerial diurnal tracking as specified above. The use of fixed-winged aircraft allowed for the collection of data over long distances and between multiple foraging areas in one night. The aerial crew consisted of a pilot and a navigator/copilot. The pilot maintained an elevation of approximately 455 meters (1,500 feet) above ground level. The navigator monitored the transmitter signal through the receiver and estimated bat location on mapping software (DeLorme Topo North America 9.0, Yarmouth, ME).

Two strategies were employed for determining a bat's location. The first involved flying the airplane in tight circles above the bat with the airplane positioned so the inside antenna was always pointed toward the bat. The second method utilized multiple crosses over the bat, listening to signal strength, switching antennas, and viewing the airplane's GPS location on the laptop. When enough information was gathered and the navigator felt confident with the bat's approximate location, a foraging point was plotted on the electronic map and labeled with a bat frequency and time.

Locations of foraging bats and capture locations were pooled and examined using fixed kernel density estimates and isopleth surface proportions completed with Geospatial Modeling Environment version 0.7.4.0 Beyer, H.L (Spatial Ecology LLC 2015) and Statistical Software R version 3.2.2 (R Core Team 2016) to determine foraging area for each individual. The foraging areas were imported into ArcGIS to calculate the 50%, 75%, and 95% probability contour for each individual bat and for all bats combined. Foraging areas were defined based on the area of use within these probability contours. The majority foraging area was defined as within the 95% probability contours with outlier locations eliminated. Areas within the 75% probability contours were considered intermediate foraging usage areas and 50% probability contours were considered core foraging areas. Probability contours were imported into ArcGIS for additional analysis using aerial photography, USGS spatial analysis, and GIS layers provided by Apex to characterize foraging areas.

RESULTS AND DISCUSSION

Mist-Net Survey

Mist-net surveys were completed at 35 sites from 19 June through 3 July 2017 (Table 1, Figure 1). A total of 337 bats of six species were captured, including one adult female Indiana bat captured at site EC 33 on 25 July 2017 (Table 2).

Big brown bats (*Eptesicus fuscus*) comprised 77 percent of total captures (n=260) and eastern red bats (*Lasiurus borealis*) comprised 15 percent of total captures (n=49). Completed bat capture data sheets are provided in Appendix A, photographs of mist-net sites are provided in Appendix B, and representative photographs of each bat species captured are provided in Appendix C.

Table 1. Mist-net site locations, Emerson Creek Wind Project, Huron County, Ohio, 2017.

Site Name	Latitude	Longitude	Site Location
EC01	41.06446	-82.81276	Woodlot surrounded by Ag fields south of Township Rd TR21
EC02	41.09058	-82.82004	Top of hill, field edge and creek below
EC03	41.10731	-82.77454	Woodlot south of OH-162 between Section Line Rd 30 & 71
EC04	41.09325	-82.80843	Woodlot behind house east of Wurtz Rd., north of Egypt Rd
EC05	41.08786	-82.76228	Ag field edge and inner woodlot east of Miller Rd
EC06	41.09948	-82.78458	Woodlot and creek west of Section Line Rd 30S, south of Section Line Rd 8
EC07	41.16328	-82.77940	Wooded trails through woodlot south of Bismark Rd
EC08	41.09603	-82.77752	Small woodlot east of section line road 30 S
EC09	41.08086	-82.77512	Woodlot behind corn field
EC10	41.10979	-82.80656	Woodlot north of Greenfield Section Line Rd. (8), West of Jennifer Rd
EC11	41.12429	-82.80682	Slate Run creek at Hwy 162
EC12	41.11554	-82.77021	Stream and woodlot adjacent to open field, north of Scottwood Rd
EC13	41.12199	-82.74908	Woodlot surrounded by Ag. fields east of Thomas Rd
EC14	41.11460	-82.72977	Dry stream bed through woodlot
EC15	41.14139	-82.78085	Slate Run south of Sherman Norwich Rd crossing
EC16	41.16760	-82.79986	Tributary of Frink Run north of Bismark Rd
EC17	41.16255	-82.80721	Wooded stream west Heyman Rd, south Bismark Rd
EC18	41.17245	-82.81506	Woodlot west of Heyman Rd (29), south of Pontiac Section Line Rd (64)
EC19	41.17047	-82.77835	Wooded trails and forest gaps in woodlot
EC20	41.18962	-82.75497	Trails through mature woodland south of Brent Rd
EC23	41.19929	-82.76884	Creek west of Dogtown Rd, north of Breit Rd
EC24	41.19100	-82.78889	Woodlot and Ag fields around Frink Run west of Section Line Rd (30N)
EC25	41.13834	-82.82994	Woodlot east of County Line Rd
EC26	41.15591	-82.78996	Woodlot west of Section Line Rd 30 N, between SLR 16 and 67
EC27	41.11034	-82.74742	Woodlot north of 162, east of Thomas Rd.
EC28	41.18013	-82.77186	Woodlot off of Pontiac Section Line Rd
EC29	41.13206	-82.79243	Slate Run creek north of Old Military Rd
EC30	41.20332	-82.78045	Creek, woodlot trails, and ag field west of CR30
EC31	41.09587	-82.82160	Irrigation ditch right of way
EC32	41.07400	-82.81908	Wooded trails west of Wurtz Rd in woodlot leading to cabin
EC33			
EC34	41.18049	-82.75337	Slate Run south of Pontiac Section Line Rd
EC35	41.08350	-82.81474	Forested drainage ditch on Wurtz Rd
EC36	41.15667	-82.76606	Slate Run Creek south of Downtown Rd
EC37	41.17626	-82.81697	Woodlot south of Pontiac Rd

Table 2. Total bat captures by species, age, sex, and reproductive status, Emerson Creek Wind Project, Huron County, Ohio, 2017.

Species	Adult Male		Adult Female				Juvenile Female	Escaped	Total
	NR	TD	P	L	PL	NR			
<i>Eptesicus fuscus</i>	95	2	7	140	5	1	1	9	260
<i>Lasiurus borealis</i>	20	0	0	20	2	0	0	7	49
<i>Lasiurus cinereus</i>	2	0	0	19	0	0	1	2	24
<i>Lasionycteris noctivagans</i>	2	0	0	0	0	0	0	0	2
<i>Myotis sodalis</i>	0	0	0	0	1	0	0	0	1
<i>Nycticeius humeralis</i>	0	0	1	0	0	0	0	0	1
NR=non-reproductive, TD=testes descended, P=pregnant, L=lactating, PL=post-lactating									337

Diurnal Radio Telemetry

In accordance with the ODNR/USFWS approved study plan, the Indiana bat (i.e., bat 636) was radio-tagged and tracked during the day to locate diurnal roost trees (Table 3). Tracking occurred for eight days (26 June – 3 July), during which time three roost locations were estimated using ground triangulation or aerial telemetry. All estimated roost locations were located on private land outside of the Project area. Therefore, specific roost trees were not identified due to access.

Bat 636 did not immediately fly upon release (25 July) and was placed on the bark of a live black oak (*Quercus velutina*) tree near the capture site. The bat appeared healthy and readily climbed up the tree. Bat 636 remained within the black oak tree for two days (26 and 27 July) and emerged after sunset on the night of 27 July. Based on consultation with USFWS and our professional opinion, the black oak tree is not considered a roost tree because bat 636 was manually placed in this tree after capture.

On 28 June, bat 636 was located 1.5 kilometers east of the capture site outside of the Project boundary. Access to the property was not available and therefore the roost location was estimated using ground triangulation. On 29 June, bat 636 was not located after 6 hours of ground searching and the aerial telemetry crew was not able to fly during the day to locate bat 636 due to inclement weather. On 30 June, bat 636 was located, but access to the property was not available and the roost location was estimated using ground triangulation. On 1 July, bat 636 was located approximately 2.1 kilometers southwest, but access to the property was denied by the land owner. The roost tree location was estimated by the aerial telemetry crew due to radio interference encountered on site by the ground telemetry crew. The bat was searched for by the aerial telemetry crew during the day and night of 2 July, and during the day on 3 July but was not heard. Telemetry efforts were subsequently concluded.

Table 3. Indiana bat captured and radio-tagged during the mist-net survey, Emerson Creek Wind Project, Huron County, Ohio, 2017.

Capture Site	Capture Date	Band Number (ODNR)	Age	Sex	Reproductive Status	Mass (g)	Right Forearm Length (mm)	Transmitter Freq. (172.xxx)
EC33	25 June	22706	Adult	Female	Post-Lactating	8.25	39	636

Emergence Counts

Due to restricted access to the estimated roost tree areas, no emergence counts were completed.

Foraging Telemetry

Foraging data were collected for bat 636 over four nights (27-29 June and 1 July) resulting in a total of 147 foraging points. The number of foraging location points collected each night ranged from 3 to 54 (Table 4). Inclement weather resulted in a limited number of foraging points collected on 29 June (n=3) and no foraging data collected on 30 June. The aerial telemetry crew attempted to locate bat 636 during the day and night of 2 July and during the day on 3 July but were unsuccessful; telemetry efforts were subsequently concluded.

Table 4. Foraging details for a radio-tagged female Indiana bat (bat 636), Emerson Creek Wind Project, Huron County, Ohio, 2017.

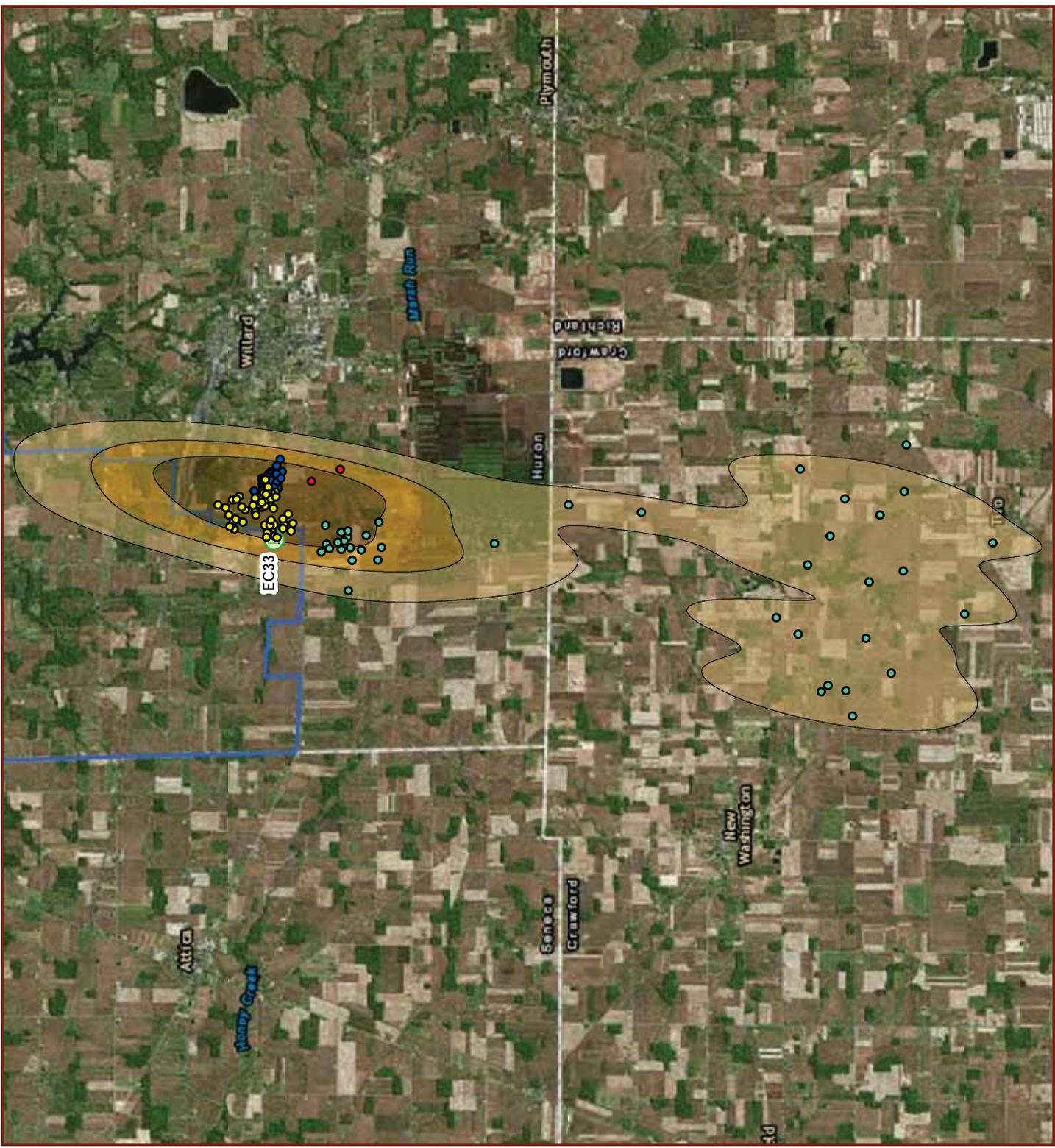
Date	Number of foraging points collected	Farthest distance traveled on a given night (m)
27 June	50	1,500
28 June	54	692
29 June*	3	1,201
1 July	40	14,130

*Inclement weather limited foraging telemetry
No foraging telemetry was conducted 30 June due to inclement weather

The distance traveled by bat 636 in a night was generally less than 1,500 m, but it did relocate on one night to an area 14.1 km south of its core foraging range (Table 4) resulting in a large home range estimate (Table 5, Figure 2). However, the core use area (50% contour) was much smaller and the majority (87%) of the home range was located outside of the project area.

Table 5. Foraging area sizes for a radio-tagged female Indiana bat (bat 636), Emerson Creek Wind Project, Huron County, Ohio, 2017.

Foraging Area (km ²)		
50% contour	75% contour	95% contour
7.0	16.0	66.8



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**Emerson Creek
Foraging Map**
Bat 636, Adult Female

Myotis sodalis



Huron and Crawford Counties,
Ohio

- | Foraging Contour | Foraging Date |
|------------------|---------------|
| 50% Probability | 6/27/2017 |
| 75% Probability | 6/28/2017 |
| 95% Probability | 6/29/2017 |
| Capture Site | 7/1/2017 |
| Project Boundary | |

Coordinate System:
NAD 1983 StatePlane
Ohio North FIPS 3401
Feet

Projection: Lambert
Conformal Conic
Datum: North
American 1983
Sources: ArcX Clean
Energy, ESRI, USGS,
Copperhead
Consulting
Date: 9/18/2017

1:120,000
or
1 inch = 10,000 ft

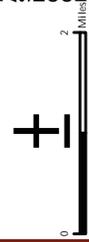


Figure 2. Foraging area contours utilized by a radio-tagged female Indiana bat (bat 636), Emerson Creek Wind Project, Huron County, Ohio, 2017.

CONCLUSIONS

Of the 337 bats captured during this survey, big brown bats comprised 77 percent (n=260) and eastern red bats comprised 15 percent (n=49) of the total captures. One adult post-lactating female Indiana bat was captured in the southeastern portion of the Project area on 25 June 2017, very close to the proposed Project boundary. No northern long-eared bats, Rafinesque's big-eared bats, or eastern small-footed bats were captured.

Although the female Indiana bat was captured within the Project area, all roost locations (n=3) were outside of the Project area as was the majority of its home range.

The nightly distance traveled among the four nights bat 636 was tracked varied greatly. Previous studies have documented linear distances between roosts and foraging areas for female Indiana bats to range from 500 - 8,400 meters, though most linear movements were less than 4,200 meters (USFWS 2007). However, the majority of these distances were collected using ground telemetry that did not often have the capability of finding a bat once it moved a long distance from its original use area. Since bat 636 was not heard after its 14,130-meter movement on 1 July, it is likely that the bat left the area or the transmitter failed.

The results of this study document summer Indiana bat presence in the southeastern portion of the Project area, and no or very low Indiana bat usage of the remaining portion of the Project area. Following the recommendations put forth in the *Indiana Bat Section 7 and Section 10 Guidance for Wind Energy Projects* (USFWS 2011) setting turbines at least 1,000 feet from suitable habitat in the southeastern portion of the Project area would avoid the potential risk of Indiana bat collision.

The lack of northern long-eared bat captures suggests this species is either absent, or present in such low densities during the summer maternity period that current survey techniques failed to detect them.

LITERATURE CITED

- Ohio Division of Natural Resources (ODNR). 2009. On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio: An Addendum to the Ohio Department of Natural Resource's Voluntary Cooperative Agreement.
- Ohio Division of Natural Resources – Division of Wildlife (ODNR-DOW). 2017. Ohio Division of Wildlife and USFWS (OH Field Office) Guidance for Bat Permitted Biologist.
- R Core Team (2017). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
- Reichard, J. D. and T. H. Kunz. 2009. White-nose syndrome inflicts lasting injuries to the wings of little brown myotis (*Myotis lucifugus*). *Acta Chiropterologica*, 11(2) 457-464.
- United States Fish and Wildlife Service (USFWS). 2007. Indiana bat (*Myotis sodalis*) draft recovery plan: first revision.
- United States Fish and Wildlife Service (USFWS). 2011. Indiana bat Section 7 and Section 10 guidance for wind energy projects. Revised: 26 October 2011.
- United States Fish and Wildlife Service (USFWS). 2017. Range-wide Indiana Bat Summer Survey Guidelines.

APPENDIX A

Mist-Net Data Sheets

Site No. 8601 Project Phase# 991-02 Project Name Apex Emerson Creek Dates 19-22 June 2017
 Site Location Woodlot surrounded by agricultural fields south of Hwy 24 Habitat Type* Bottomland Forest
 County Harlan State OH Permittee J. Hawken Technician(s) A. Wolak
 Lat/Long or UTM (circle one): N/Easting 41,064461 W/Northing 82,81276 Datum WGS 84 UTM Zone



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments (Part #)	Date	Time	Temp (°F)	Sky	Wind	Comments	Moon rise	Moon set	Moon %	Sunrise	Sunset
1	6/19/17	2145	EPFU	A	F	L	19.3	50	A	5.0	0	-	-	-	6/19/17	2100	70	2	/	-	0250	1556	22	0558	2106
2	6/19/17	2145	EPFU	A	M	NR	15.0	46	B	1.5	0	-	-	-	6/19/17	2200	68	1	/	-	-	-	-	-	
3	6/19/17	2145	EPFU	A	M	NR	16.3	45	C	3.5	0	-	-	-	6/19/17	2300	65	1	0	-	-	-	-	-	
4	6/19/17	2230	EPFU	A	F	P	26.3	47	A	5.5	0	-	-	-	6/19/17	0000	61	0	/	-	-	-	-	-	
5	6/19/17	2230	NYHU	A	F	P	13.5	36	A	2.5	0	-	-	-	6/19/17	0106	61	0	/	-	-	-	-	-	
6	6/19/17	2230	EPFU	A	F	L	19.0	48	A	3.0	0	-	-	-	6/19/17	2100	70	2	/	-	-	-	-	-	
7	6/19/17	2230	EPFU	A	F	L	19.3	47	A	2.5	0	-	-	-	6/19/17	2200	68	1	/	-	-	-	-	-	
8	6/19/17	2230	LABO	A	F	L	13.0	40	C	2.5	0	-	-	-	6/19/17	2300	65	1	0	-	-	-	-	-	
9	6/19/17	2315	EPFU	A	F	L	15.8	43	A	3.5	0	-	-	-	6/19/17	0000	61	0	/	-	-	-	-	-	
10	6/19/17	2315	EPFU	A	F	L	16.0	44	A	4.5	0	-	-	-	6/19/17	0106	61	0	/	-	-	-	-	-	
11	6/19/17	2345	EPFU	A	F	L	18.3	45	A	3.0	0	-	-	-	6/19/17	2100	70	2	/	-	-	-	-	-	
12	6/19/17	2415	LACI	A	M	N	28.0	50	A	3.5	0	-	-	-	6/19/17	2200	80	2	/	-	-	-	-	-	
13	6/19/17	0015	LACI	A	F	L	31.0	55	A	2.5	0	-	-	-	6/19/17	2300	79	2	/	-	-	-	-	-	
14	6/19/17	0015	EPFU	A	F	L	17.5	47	A	2.5	0	-	-	-	6/22/17	2100	81	2	/	-	-	-	-	-	
1	6/22/17	2245	EPFU	A	M	N	13.0	45	A	3.0	0	-	-	-	6/22/17	2200	80	2	/	-	-	-	-	-	
2	6/22/17	2330	EPFU	A	F	L	22.0	51	A	2.0	TP	-	-	-	6/22/17	2300	79	2	/	-	-	-	-	-	
3	6/22/17	0030	EPFU	A	F	L	20.5	47	A	2.0	0	-	-	-	6/22/17	0000	76	2	/	-	-	-	-	-	
4	6/22/17	0030	EPFU	A	F	L	21.0	48	A	2.5	0	-	-	-	6/22/17	0100	76	2	/	-	-	-	-	-	
5	6/22/17	0030	EPFU	A	M	NR	15.8	45	D	3.0	0	-	-	-	6/22/17	0100	76	2	/	-	-	-	-	-	

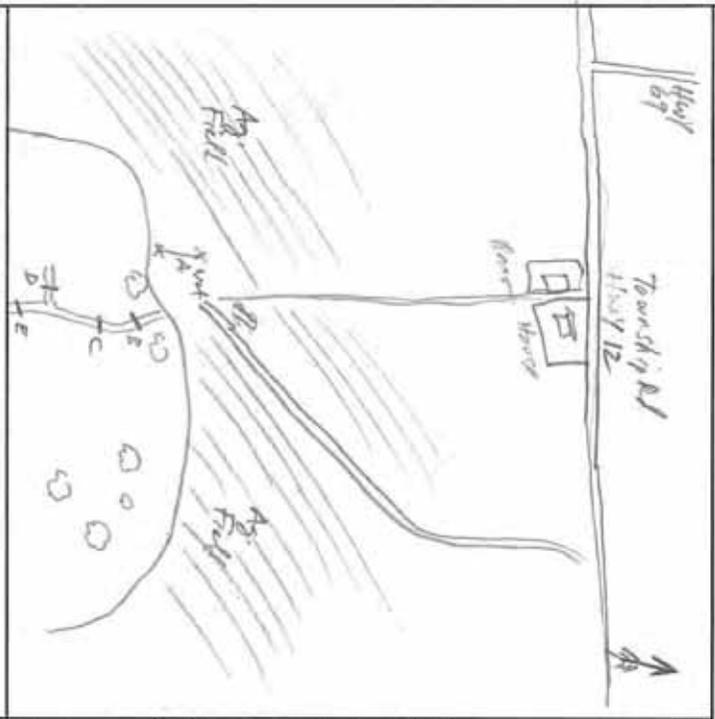
Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COV); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus intermedius* (LAIN); *Lasiurus teminckii* (LASE); *Lasiurus noctivagus* (LANO); *Miyois auctroriparus* (MYAU); *Miyois grisescens* (MYGR); *Miyois lalibi* (MYLF); *Miyois leucogus* (MYLU); *Miyois septentrionalis* (MYSE); *Miyois sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perisoreus subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

*Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. EC01 Project Phase# 491.02 Project Name Apex Envision Creek Dates 1922 June 2017

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat						
A = 9.0	x 9.0	6/15, 6/22	Habitat	A	B	C	D	E	F
B = 6.5	x 6.0	6/19, 6/22	Corridor		X				
C = 6.5	x 6.0	6/19, 6/22	Road Rut			X			
D = 6.5	x 6.0	6/19, 6/22	Creek				X		
E = 6.5	x 6.0	6/19	River						
F =	x		Pond						
Net Set GPS Location (UTM or Lat/Long)			Forest Gap						
A =			Cave						
B = N41.06438		W82.81284	Mine						
C = N41.06441		W82.81296	Tree						
D = N41.06397		W82.81335	Other list						
E = N41.06377		W82.81306	Other list	X					
F = N41.06487		W82.81307	Dominant Vegetation						
Transmitters			1. <i>Acer rubrum</i>						
Band#	Band#		2. <i>Fagus grandifolia</i>						
Freq.	Freq.		3. <i>Fraxinus pennsylvanica</i>						
Brand	Brand		4. _____						
Weight	Weight		5. _____						
#days	#days		6. _____						
			7. _____						
			8. _____						

Potential listed bat habitat at site:

- Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

- Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road cuts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

- Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor): 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

- Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EQ03 Project Phase# 591.02 Project Name Alex Emerson Creek Dates 19 + 24 June 17
 Site Location Woodlot south of OH-102 between Section Line Rd 30 + 71, east side Habitat Type* Bottomland Forest
 County Huron State OH Permittee P. Roby Technician(s) Beaman Burns
 Lat/Long/ UTM (circle one): N Easting 41,10731 W Northing 82,77454 UTM Zone 18 Datum NAD83 COPPERHEAD CONSULTING ENGINEERS

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	REA (mm)	Net	Height (m)	WDI	Band#	Freq	Comments
1	19 June	21:58	EPFU	A	M	NR	16.5	41	E	1.5	Ø	—	—	photos
2	19 June	22:20	EPFU	A	M	NR	16.0	44	A	1.5	Ø	—	—	
3	19 June	22:20	EPFU	A	M	NR	17.0	47	A	2.0	Ø	—	—	
4	19 June	22:30	EPFU	A	F	L	21.5	47	E	1.0	Ø	—	—	
5	19 June	22:30	EPFU	A	M	NR	16.5	45	E	2.0	Ø	—	—	
6	19 June	22:30	EPFU	A	F	P	24.0	44	C	5.0	Ø	—	—	
7	19 June	00:15	EPFU	A	M	NR	16.75	46	E	2.0	Ø	—	—	
1	24 June	21:25	EPFU	A	M	NR	14.5	46	D	3.0	Ø	—	—	

Date	Time	Temp (°F)	Sky	Wind	Comments
19 June	21:00	67	3	1	—
19 June	22:00	64	1	2	—
19 June	23:00	62	0	0	—
19 June	24:00	61	0	0	—
19 June	1:00	59	0	0	—
24 June	2:00	59	0	0	—
24 June	21:00	67	1	0	—
24 June	22:00	66	1	0	—
24 June	23:00	63	1	0	—
24 June	24:00	62	1	0	—
24 June	01:00	60	2	0	—
24 June	02:00	60	2	0	—

Species Abbreviations: *Corynorhinus virginianus* (CORV); *Corynorhinus t. virginianus* (COV); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus semiostris* (LASE); *Lasiurus noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLI); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctaleis sumneri* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

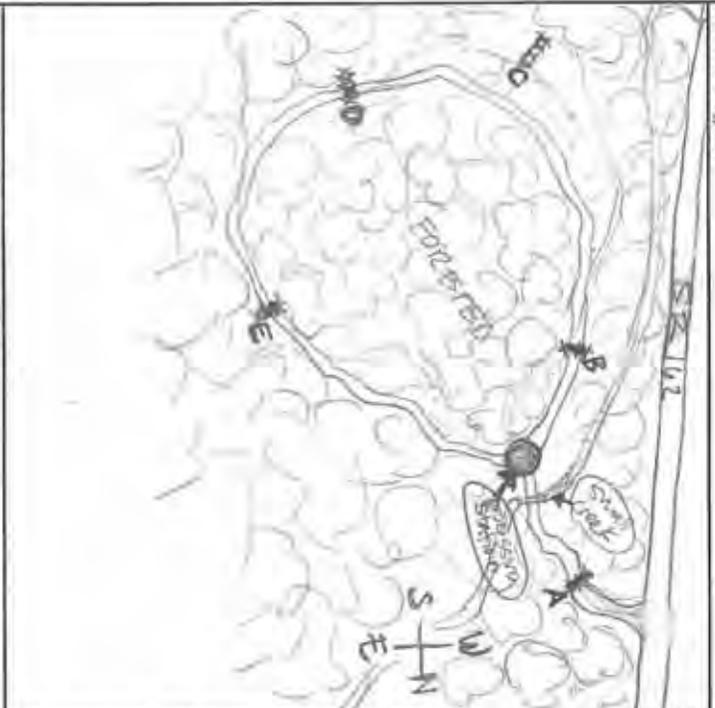
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Sky Code	Beaufort Wind Scale
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Site No. EC03 Project Name Per Emerson Creek Dates 19 + 24 June 12

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat						
A = 5.2	x 6	19 + 24 June	Habitat	A	B	C	D	E	F
B = 7.8	x 9	19 + 24 June	Corridor	✓	✓	✓	✓	✓	
C = 5.2	x 9	19 + 24 June	Road Run						
D = 5.2	x 6	19 + 24 June	Creek						
E = 5.2	x 9	19 + 24 June	River						
F = x	x		Pond						
			Forest Gap						
			Cave						
			Mine						
			Tree						
			Other: list						

Net Set GPS Location (UTM or Lat/Long)		Transmitters	
A = 41,10731	-82,77454	Band#	Band#
B = 41,10723	-82,77610	Freq.	Freq.
C = 41,10707	-82,77622	Brand	Brand
D = 41,10647	-82,77623	Weight	Weight
E = 41,10637	-82,77533	#days	#days
F =			

Potential listed bat habitat at site:

1. Roost habitat: **1. Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

2. Water Resources: **1. Poor:** bat drinking resources not present at the site. **2. Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal:** Streams or ponds (including road cuts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

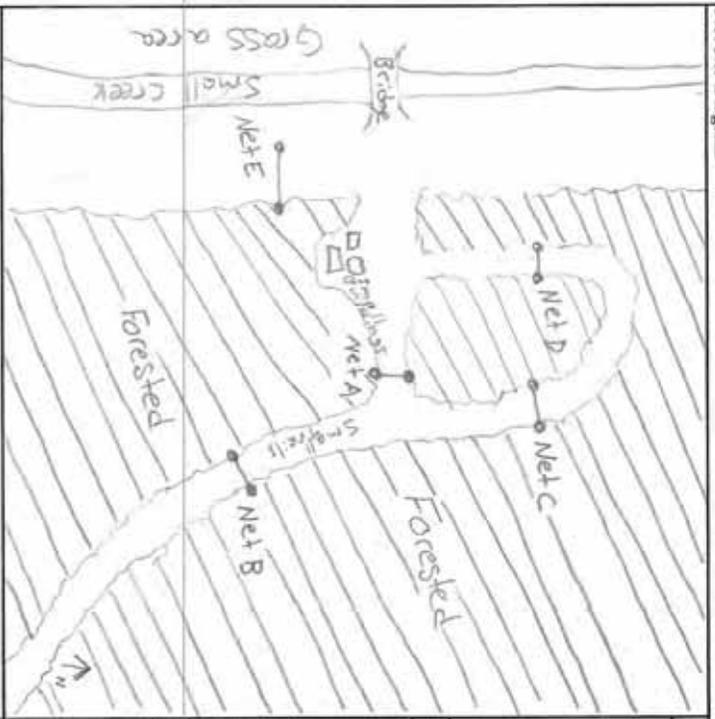
3. Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). **1. Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

4. Land Cover: **1. Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. **2. Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. **3. Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. Ec04 Project Phase# 591.01 Project Name Acex Emerson creek Dates 6/19, 6/26

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat						
A = 5.4 x 6		6/19, 6/26	Habitat	A	B	C	D	E	F
B = 5.4 x 9		6/19	Corridor	✓	✓	✓	✓		
C = 5.4 x 6		6/19, 6/26	Road Rut						
D = 5.4 x 6		6/19, 6/26	Creek						
E = 7.2 x 9		6/19, 6/26	River						
F = x			Pond						
			Forest Gap						
			Cave						
			Mine						
			Tree						
			Other list						
			Edbc					✓	

Net Set GPS Location (UTM or Lat/Long)	
A = 41.09325	-82.80843
B = 41.09302	-82.80820
C = 41.09362	-82.80831
D = 41.09359	-82.80856
E = 41.09295	-82.80887
F =	

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

Dominant Vegetation	
1. <i>agus grandifolia</i>	3. _____
2. <i>acer rubrum</i>	6. _____
3. _____	7. _____
4. _____	8. _____

Potential listed bar habitat at site:

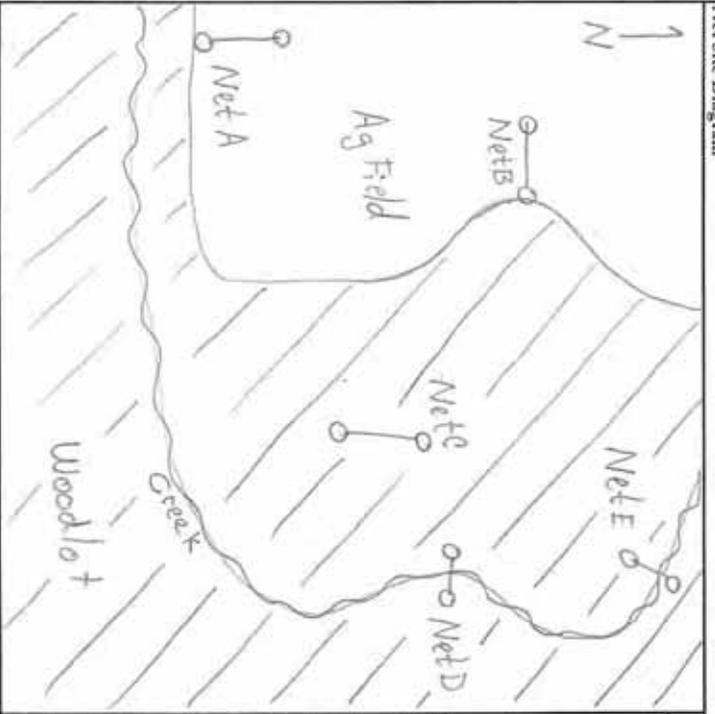
1. **Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

2. **Water Resources:** 1. **Poor:** bar drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

2. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
 2. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: 11 minutes were added to the end of the survey due to light rain.

Site No. ECAS Project Phase# S91.02 Project Name Apex Emerson Creek Dates 19 June 2017, 24 June 2017
 Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat						
A = 5.2	x 12	19 June, 24 June	Habitat	A	B	C	D	E	F
B = 7.9	x 9	19 June, 24 June	Corridor						
C = 5.2	x 9	19 June, 24 June	Road Rut						
D = 5.2	x 6	19 June, 24 June	Creek				X	X	
E = 5.2	x 6	19 June, 24 June	River						
F =	x		Pond						
Net Set GPS Location (UTM or Lat/Long)			Forest Gap			X			
A = 41.08786		-82.76228	Cave						
B = 41.08804		-82.76209	Mine						
C = 41.08795		-82.76167	Tree						
D = 41.08770		-82.76129	Other list	Edge	Field				
E = 41.08821		-82.76101	Edge	Field	Edge				
F =			Dominant Vegetation						
Transmitters			1. <i>Acer saccharum</i>	5. <i>Synlone nigra</i>					
Band#	Band#	Band#	2. <i>Carya spp</i>	6. _____					
Freq. _____	Freq. _____	Freq. _____	3. <i>Aesculus glabra</i>	7. _____					
Brand _____	Brand _____	Brand _____	4. <i>Ulmus rubra</i>	8. _____					
Weight _____	Weight _____	Weight _____							
#days _____	#days _____	#days _____							

Potential listed bat habitat at site:

2. Roost habitat: 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

3. Water Resources: 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road cuts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

2. Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).

1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

1. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.

2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.

3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. FCM Project Phase# 591.02 Project Name Apex Emerson Creek Date 21 + 25 JUNE 17
 Site Location Small wooded lot and creek west of Section 14, 205 S. of Section 14 & 18 Habitat Type* Creek/riparian
 County HURON State OH Permittee P. Eddy Technician(s) Leanne Burns
 Lat/Lon or UTM (circle one) N/Easting 41.09948 SW/Northing 82.78458 UTM Zone 18N Datum NAD83 COPPERHEAD
 VERIFIED SURVEYING

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Freq	Comments
1	21JUN	22:00	EPFU	A	F	L	18.5	48	E	5	0			Photos
2		22:22	EPFU	A	F	L	20.5	48	D	0.5	0			
3		22:25	EPFU	A	M	NR	16.5	44	B	1.5	0			
4		22:30	EPFU	A	M	NR	16.8	47	E	2	0			Photos
5		22:30	LACI	A	F	L	28	54	E	3	0			
6		22:30	LACI	A	F	L	31	54	E	4	0			
7		22:30	LACI	A	F	L	32	53	E	4.5	0			
8		22:40	LANO	A	M	NR	11.85	41	A	1.5	0			Photos
9		22:40	LANO	A	M	NR	12.35	33	A	2.0	0			Photos
10		23:30	EPFU	A	M	NR	16.5	43	D	1.0	0			
11		23:56	LACI	A	F	L	31.0	55	C	5.0	0			
12		23:59	LABB	A	F	L	16.0	46	A	0	0			
13		01:38	EPFU	A	M	NR	16.0	44	D	3.5	0			
14		01:38	EPFU	A	M	NR	17.35	45	D	3	0			
15		02:07	LACI	A	F	L			C	4	0			RECORDED
16		02:08	EPFU	A	M	NR	16	45	C	3	0			
17		03:00	LACI	A	F	L	30	57	B	1.5	0			
1	25JUN	22:18	EPFU	A	F	L	15.5	46	E	2	0			
2		00:25	LACI	A	F	L	32	57	D	1.5	0			
3		00:55	LACI	A	F	L			C	2				Striped

Species Abbreviations: *Corynorhinus virginianus* (CORV); *Corynorhinus t. virginianus* (COV); *Eptesillus fulvus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus teminckii* (LATE); *Lasiurus noctingens* (LANO); *Myotis austroriparius* (MAUR); *Myotis grisescens* (MYGR); *Myotisotis* (MYOT); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodini* (MYSO); *Neotis serripes* (NYSR); *Perimyotis subflavus* (PISU); *Tadarida brasiliensis* (TABR)
 Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
 *Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Date	Time	Temp (°F)	Sky	Wind	Comments
21JUN	21:00	65	3	0	
	22:00	63	2	0	
	23:00	66	2	0	
	00:00	65	3	0	
	01:00	65	3	0	
	02:00	64	1	0	
25JUN	21:00	64	2	0	
	22:00	61	2	0	
	00:00	61	3	0	
	01:00	59	3	0	
	02:00	57	1	0	
	02:00	58	3	0	

Sky Code	0	1	2	3	4	5	6
Clear							
Few Clouds							
Partly Cloudy							
Cloudy or overcast							
Fog or smog							
Drizzle or light rain							
Heavy rain - thunder storm							

Beaufort Wind Scale	0	1	2	3	4
0	Calms <1 mph				
1	Light breeze: 1-3 mph				
2	Light breeze: 4-6 mph				
3	Gentle breeze: 7-10 mph				
4	Moderate breeze: 11-16 mph				

Site No. EC07 Project Phase# 591.02 Project Name APEX Emerson Creek Dates 23 June 17:28 - 28 June 2017
 Site Location Wooded trails through woodlot south of Bismark Rd Habitat Type* Bottomland Forest
 County Huron State DH Permittee Zack Baer Technician(s) Keith Dreyer, Molly Gooden
 Lat/Long/ UTM (circle one): (N) Easting 41,16328 (W) Northing -82,77940 UTM Zone 18 Datum NAD 83 COPPERHEAD PROFESSIONAL CONSULTANTS

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	REVA (mm)	Net	Height (m)	WDI	Band#	Freq.	Comments
1	23 Jun	2130	EPFU	A	F	L	17.0	49	D	5	0			*
2	23 Jun	2130	EPFU	A	F	L	14.25	44	D	3	0			
3	23 Jun	2150	EPFU	A	M	N	15.0	46.5	D	5	0			
4	23 Jun	2150	LABO	A	M	N	12.75	40	D	6	0			
5	23 Jun	2210	EPFU	A	F	L	19.0	47	D	3	0			
6	23 Jun	2230	EPFU	A	F	L	22.25	48	B	3	0			
7	23 Jun	2250	EPFU	A	F	L	21.0	48	D	4	0			
8	23 Jun	2355	EPFU	A	F	L	19.5	44	D	5	0			
9	23 Jun	0208	LABO	A	F	L	15.5	41.5	A	2	0			
1	28 Jun	2235	EPFU	A	M	N	17.75	46	E	7	0			
2	28 Jun	2235	LABO	A	M	N	10.75	37	E	6.5	0			
3	28 Jun	0120	EPFU	A	F	L	18.5	45	D	4.5	0			
4	28 Jun	0140	EPFU	A	F	L	19.0	47	D	4	0			

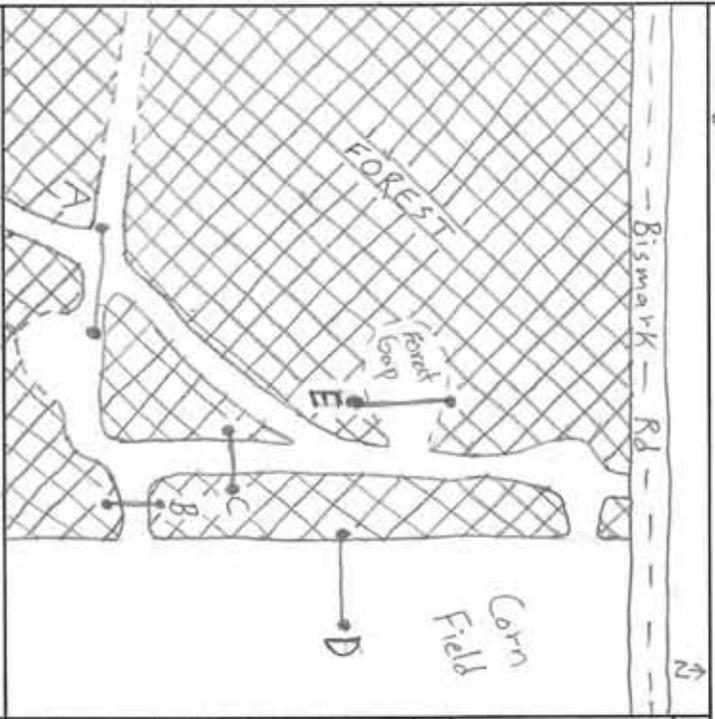
Date	Time	Temp (F)	Sky	Wind	Comments
6-23	2108	71	3	1	
6-23	2208	69	3	1	
6-23	2308	68	2	1	
6-23	0008	68	1	1	
6-23	0108	65	0	2	
6-23	0208	63	0	2	
6-24	0106	72	3	2	
6-24	0208	70	2	2	
6-24	0308	69	1	2	
6-24	0408	68	0	2	
6-24	0108	68	2	2	
6-24	0208	68	3	2	

Species Abbreviations: *Corynorhinus rafinesquii* (CORV); *Corynorhinus l. virginianus* (COVD); *Epitaxius fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasiurus naevius* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis liliif* (MYLI); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctaleus humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Neon Repro: N; Unknown: U
Habitat Type: Creek/diparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

* 2 punches left wing, mostly healed
 Copperhead Consulting Ph:859-925-9012 Please return to: P.O. Box 73, Paint Lick, KY 40461



Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat						
A = 5.2	x 12	6-25	Habitat A	B	C	D	E	F	
B = 5.2	x 6	6-25, 6-28	Corridor	X	X	X			
C = 5.2	x 6	6-23, 6-28	Road Rut						
D = 5.2	x 9	6-23, 6-28	Creek						
E = 7.5	x 9	6-23, 6-28	River						
F =	x		Pond						
Net Set GPS Location (UTM or Lat/Long)			Forest Gap				X		
A = 41,16328		-82.77940	Cave						
B = 41,16288		-82.77836	Mine						
C = 41,16344		-82.77845	Tree						
D = 41,16401		-82.77817	Other: list						
E = 41,16404		-82.77856							
F =									
Transmitters			Dominant Vegetation						
Band#	Freq.	Brand	Weight	#days	Band#	Freq.	Brand	Weight	#days
					1	<i>Acer saccharum</i>			
					2	<i>Ostrya virginiana</i>			
					3	<i>Quercus palustris</i>			
					4	<i>Fagus grandifolia</i>			
					5	<i>Carya ovata</i>			
					6				
					7				
					8				

Potential listed bat habitat at site:

- Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

- Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

- Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging. 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

- Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC08 Project Phase# 59102 Project Name Alder Emerson Creek Dates 6/24 6/29
 County Harrison State OH Permittee Kate Baer/Emily Cotton Technician(s) Kate Baer/Emily Cotton
 Lat/Lon of UTM (circle one): N/Easting 41,09,608 W/Northing 82,77252 UTM Zone 18Q Datum NAD83



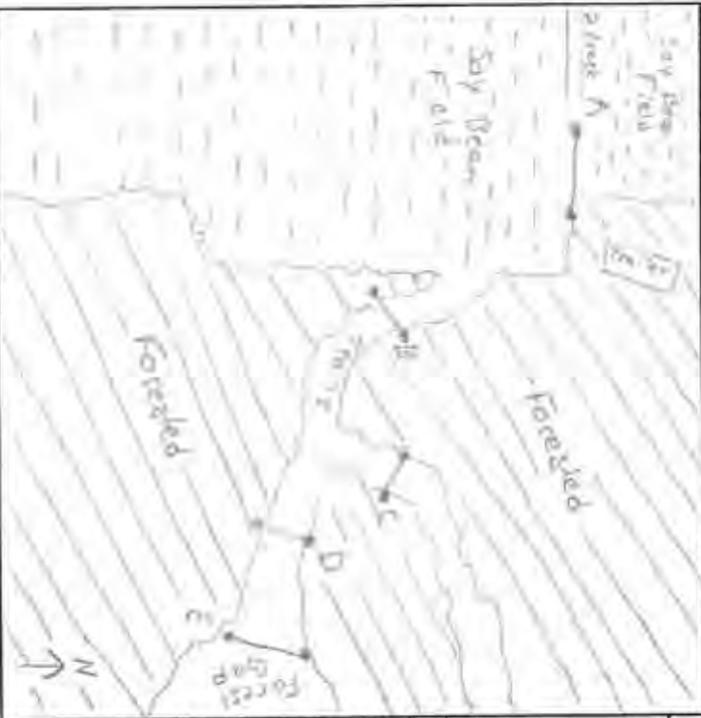
#	Date	Time	Species	Age	Sex	Reprn	Mass (g)	RFA (mm)	Nei	Height (m)	WDI	Band#	Freq	Comments
1	6/24	2228	EPV	A	F	L	22	49	A	4	0			
1	6/29	2139	EPV	A	M	NR	145	45	E	4	0			
2	6/29	2139	EPV	A	M	NR	145	45	E	4	0			

Date	Time	Temp (°F)	Sky	Wind	Comments
6/24	2108	65	2	1	
6/24	2208	64	2	1	
6/24	2308	60	2	1	
6/24	0908	60	1	D	
6/24	0108	55	0	0	
6/24	0208	57	3	0	
6/24	0308	73	2	0	
6/24	2308	67	3	0	
6/24	0008	67	1	0	
6/24	0108	68	2	1	
6/24	0208	69	3	1	

Species Abbreviations: *Corynorhinus rufescens* (CORR); *Corynorhinus l. angustatus* (COVL); *Ephedrus fuscus* (EPFU); *Lanius borealis* (LABO); *Lanius excubitor* (LACD); *Lanius excubitor* (LANS); *Lanius excubitor* (LANO); *Myiarchus cinerascens* (MYCI); *Myiarchus cinerascens* (MYAN); *Myiarchus cinerascens* (MYCH); *Myiarchus cinerascens* (MYLE); *Myiarchus cinerascens* (MYLU); *Myiarchus cinerascens* (MYSI); *Myiarchus cinerascens* (MYSO); *Sayornis bonasus* (SYBU); *Perisoreus inornatus* (PISU); *Tachycineta thalassina* (TABR)
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Reprn: N; Unknown: U
Habitat Type: Creek/ riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. EC08 Project Phase# 541.02 Project Name AFEX Eastern Creek Dates 6/24 + 6/29

Net Site Diagram



Net height x net length (m)	Dates
A = 5.2 x 12	6/24 + 6/29
B = 5.2 x 6	6/24 + 6/29
C = 5.2 x 6	6/24 + 6/29
D = 5.2 x 9	6/24 + 6/29
E = 2.8 x 9	6/24 + 6/29
F = x	

Net Set GPS Location (UTM or Lat/Long)
A = 41,096,03
B = 41,085,56
C = 41,095,67
D = 41,095,38
E = 41,085,11
F =

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor		✓				
Road Run						
Creek						
River						
Pond						
Forest Gap					✓	
Cave						
Mine						
Tree						
Other list	✓					
	edge					

Dominant Vegetation	
1. <u>Quercus velutina</u>	5
2. <u>Quercus rubra</u>	6
3. <u>Acer rubrum</u>	7
4. _____	8

Potential listed bat habitat at site:

Roost Habitat: 1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

Water Resources: 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road cuts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1. poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present nor connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC 09 Project Phase# 591.02 Project Name Apex Emerson Creek Dates 2015 June 2017
 Site Location Woodlot behind corn field State OH Permittee G. Janos Technician(s) W. Selter & T. Burns Habitat Type* Upland forest
 County Huron Lat/Lon or UTM (circle one): N/Easting 41.08086 (W/Northing) -82.77512 UTM Zone 18Q Datum NAD 83 COPPERHEAD
 RESEARCH ASSOCIATES



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Freq	Comments
1	6/20	2200	EPFU	A	M	NR	15.0	49.0	B	1.0	0			
2	6/20	2215	EPFU	A	F	L	18.25	45.0	A	2.0	0			
3	6/20	2215	LABD	-	-	-	-	-	A	6.5	-			Escape
4	6/20	2310	EPFU	-	-	-	-	-	A	3.0	-			Escape
5	6/20	2330	EPFU	A	F	L	21.5	49.0	A	2.0	0			
6	6/20	0030	EPFU	A	M	NR	16.25	44.0	A	6.0	0			
7	6/20	0050	EPFU	A	F	L	21.75	50.0	A	2.5	0			
8	6/20	0245	LABD	A	F	L	16.25	41.5	D	2.0	0			
1	6/25	2120	EPFU	A	F	L	17.0	50.0	A	5.0	0			
2	6/25	2250	EPFU	A	F	L	20.25	51.0	A	3.0	0			

Species Abbreviations: *Corynorhinus rufescens* (CORN); *Corynorhinus l. virginianus* (COVL); *Epsteinia fuscus* (EPFU); *Lanius borealis* (LABO); *Lanius nitens* (LANI); *Lanius ludovicianus excubitorides* (LASE); *Lanius borealis* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotisotis* (MYOT); *Myotis bairdii* (MYBI); *Myotis lasiurus* (MYLA); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctaleis borealis* (NYBO); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Date	Time	Moon%	Moon rise	Moon set	Sunrise	Sunset	Comments
6/20	25	3/25	17:07	5:58	21:06		
6/25	0	0747	2236	0559	2107		

Beaufort Wind Scale	
0	Calm <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Site No. EC09 Project Phase# 51102 Project Name Apex Environmental Dates 6/20 + 6/25

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat					
A = 9.8	x 9	6/20, 6/25	Habitat A	B	C	D	E	F
B = 5.2	x 9	6/20, 6/25	Corridor	X		X	X	
C = 5.2	x 6	6/20, 6/25	Road Rut					
D = 5.2	x 9	6/20, 6/25	Creek				X	
E = 5.2	x 4	6/20	River					
F =	x		Pond					
Net Set GPS Location (UTM or Lat/Long)			Forest Gap	X				
A = 41.08128		-82.77477	Cave					
B = 41.08101		-82.77466	Mine					
C = 41.08086		-82.77512	Tree					
D = 41.08075		-82.77522	Other: list					
E = 41.08124		-82.77517						
F =								
Transmitters			Dominant Vegetation					
Band#	_____	Band#	_____	_____	_____	_____	_____	_____
Freq.	_____	Freq.	_____	1. <u>C. Ovals</u>	_____	5. _____	_____	_____
Brand	_____	Brand	_____	2. <u>E. Gleditsia</u>	_____	6. _____	_____	_____
Weight	_____	Weight	_____	3. <u>A. Sycamore</u>	_____	7. _____	_____	_____
#days	_____	#days	_____	4. <u>P. D. Toads</u>	_____	8. _____	_____	_____

Potential listed bat habitat at site:

- 1. **Roost habitat:** 1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.

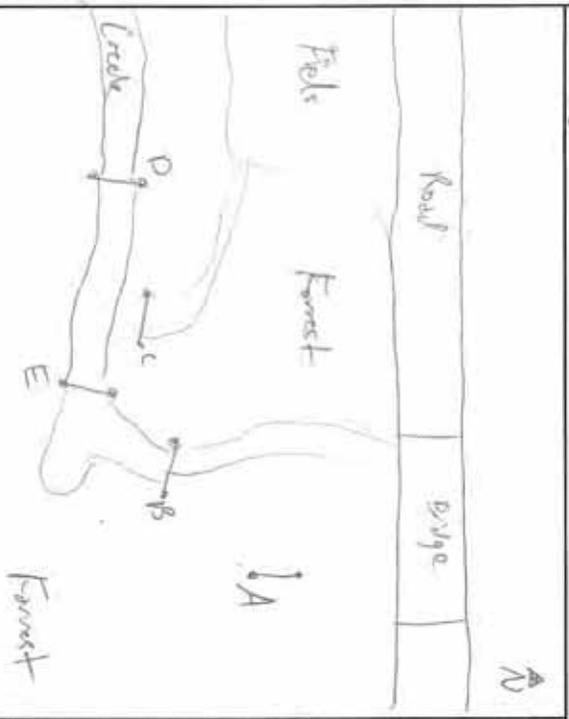
- 2. **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

- 2. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor), 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

- 2. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. LC11 Project Phase# 591.02 Project Name After Evinson Creek Dates 20+25 Jun 17
 Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat						
A = 7.8	x 9.0	20, 25 Jun 17	Habitat	A	B	C	D	E	F
B = 5.2	x 9.0	20, 25 Jun 17	Corridor						
C = 5.2	x 6.6	20, 25 Jun 17	Road/Rut						
D = 5.2	x 6.6	20, 25 Jun 17	Creek						
E = 2.6	x 6.0	20 Jun 17	River						
F =	x		Pond						
Net Set GPS Location (UTM or Lat/Long)			Forest Gap						
A = 41,124,653		-82,80,6611	Cave						
B = 41,124,546		-82,80,7003	Mine						
C = 41,124,348		-82,80,7459	Tree						
D = 41,124,922		-82,80,7697	Other: list						
E = 41,124,188		-82,80,7207							
F =									
Transmitters			Dominant Vegetation						
Band#		Band#	1. <i>Ulmus rubra</i>	5. _____					
Freq.		Freq.	2. <i>Salicetis triacanthos</i>	6. _____					
Brand		Brand	3. <i>Quercus rubra</i>	7. _____					
Weight		Weight	4. <i>Platanus occidentalis</i>	8. _____					
#days		#days							

Potential listed bat habitat at site:

3. **Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.

3. **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

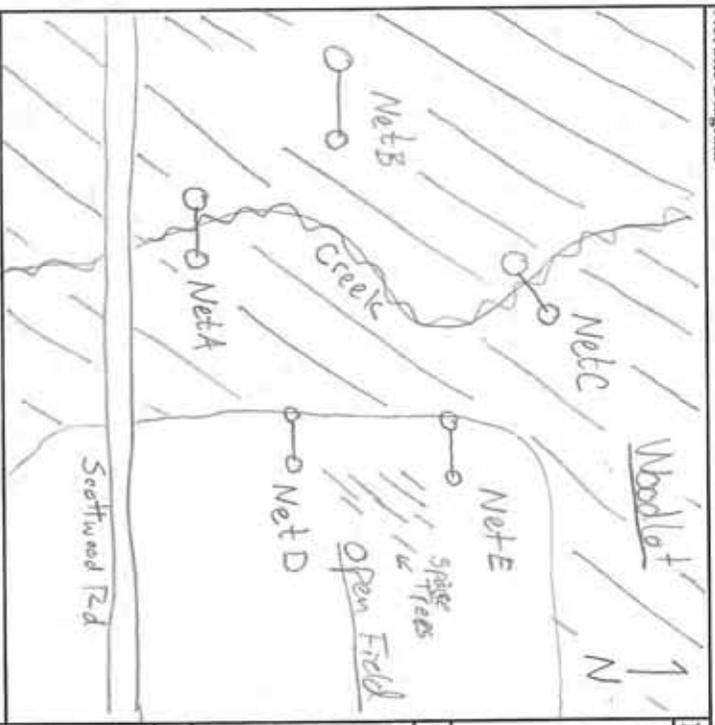
2. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging.
 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare.
 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:
 25 Jun 17 - Remove net E

Site No. EC12 Project Phase# 591.02 Project Name Emerson Creek Dates 20 June 2017, 26 June 2017

Net Site Diagram



Net height x net length (m)		Dates 2017	Net Set by Habitat						
A = 5.2	x 6	20 June 2017	Habitat	A	B	C	D	E	F
B = 5.2	x 9	20 June 2017	Corridor						
C = 5.2	x 6	20 June 2017	Road Rut						
D = 7.8	x 9	20 June 2017	Creek	X				X	
E = 5.2	x 12	20 June 2017	River						
F =	x		Pond						
Net Set GPS Location (UTM or Lat/Long)			Forest Gap	X					
A = 41,11554		-82, 77081	Cave						
B = 41,11600		-82, 77019	Mine						
C = 41,11634		-82, 76991	Tree						
D = 41,11626		-82, 76974	Other list						
E = 41,11699		-82, 76991							
F =									
Transmitters			Dominant Vegetation						
Band#	Band#	Band#	1. <u>Acer saccharum</u>						
Freq.	Freq.	Freq.	2. <u>Platanus occidentalis</u>						
Brand	Brand	Brand	3. <u>Populus deltoides</u>						
Weight	Weight	Weight	4. <u>Ulmus rubra</u>						
#days	#days	#days	5. _____						
			6. _____						
			7. _____						
			8. _____						

Potential listed bat habitat at site:

2. **Roost habitat:** 1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

3. **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

3. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging.
 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare.
 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
 2. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC3 Project/Physic# #59186 Project Name W114
 Site Location W114 situated by Ave. Hills & Parcel 50 34-0010-d-003-0000 Habitat Type Buffaloberry/White Pond
 County Huron State OH Permittee J. Hawkins Technician(s) A. Wink
 Lat./Lon or UTM (circle one): S/Easting 41,19159 N/W/Northing 82,34908 UTM Zone 17M Date 20/24/2017
 Datum WGS 84



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	REA (mm)	Net	Height (m)	WDI	Band#	Feed	Comments
1	6/20/17	21:45	EPF4	A	M	N	14.3	47	B	2.0	0	-	-	
2	6/20/17	21:45	EPF4	A	M	N	18.0	46	D	3.5	0	-	-	
3	6/20/17	21:00	EPF4	A	M	N	15.3	43	E	3.5	0	-	-	
4	6/20/17	22:15	LAR0	A	F	L	12.3	39	A	0.5	0	-	-	
5	6/20/17	22:15	EPF4	A	F	L	16.5	45	A	3.0	0	-	-	
6	6/20/17	22:15	EPF4	A	F	P	24.3	47	A	1.0	0	-	-	
7	6/20/17	22:30	EPF4	A	M	N	15.0	45	B	2.0	0	-	-	
8	6/20/17	22:45	EPF4	A	F	L	16.8	45	E	2.5	0	-	-	
9	6/20/17	22:45	EPF4	A	M	N	15.5	47	E	2.0	0	-	-	
10	6/20/17	22:45	EPF4	A	F	L	14.5	42	C	2.5	0	-	-	
11	6/20/17	22:45	EPF4	A	F	P	22.5	48	C	5.0	0	-	-	
12	6/20/17	22:45	EPF4	A	F	L	18.5	45	D	2.5	0	-	-	
13	6/20/17	25:00	EPF4	A	M	N	13.0	47	A	1.5	0	-	-	
14	6/20/17	23:30	EPF4	A	M	N	16.0	45	E	3.0	0	-	-	
15	6/20/17	23:30	EPF4	A	F	L	17.5	47	E	2.5	0	-	-	
16	6/20/17	00:00	EPF4	A	M	N	18.0	43	A	1.5	0	-	-	
17	6/20/17	00:00	EPF4	A	F	L	19.5	47	B	2.5	0	-	-	
18	6/20/17	01:15	EPF4	A	F	L	19.0	46	B	3.5	0	-	-	
19	6/20/17	01:45	EPF4	A	F	L	17.5	50	C	2.5	0	-	-	
1	6/24/17	22:00	EPF4	A	F	L	18.8	47	B	2.0	0	-	-	
2	6/24/17	22:00	EPF4	A	F	L	20.5	47	E	2.0	0	-	-	
3	6/24/17	22:00	EPF4	A	F	L	15.0	46	E	3.5	0	-	-	
4	6/24/17	22:30	EPF4	A	M	N	16.5	45	E	2.0	0	-	-	
5	6/24/17	23:30	EPF4	A	F	L	20.0	48	E	4.0	0	-	-	

Species Abbreviations: *Corynorhinus ruficapillus* (CORR); *Corynorhinus t. ruficapillus* (COVRT); *Lepidochus fuscus* (LEPFU); *Lasiurus borealis* (LAR0); *Lasiurus thorus* (LACT); *Lasiurus somnolus* (LASE); *Lasiurus v. v. somnolus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis kalinii* (MYKL); *Myotis lasiocarpus* (MYLA); *Myotis septentrionalis* (MYSE); *Myotis sodleyi* (MYSO); *Nyctalexis humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR).

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; field edge; Open field; Other

Date	Time	T emp (°F)	Sky	Wind	Sunrise	Sunset
20/20/17	21:00	74	3	2	0558	2107
20/20/17	22:00	69	3	1	0558	2107
20/20/17	23:00	63	3	0	0558	2107
20/20/17	00:00	59	2	0	0558	2107
20/20/17	01:00	54	2	0	0558	2107
20/20/17	02:00	57	2	0	0558	2107
20/20/17	03:00	66	1	0	0558	2107
20/20/17	04:00	62	1	0	0558	2107
20/20/17	05:00	65	1	0	0558	2107
20/20/17	06:00	65	1	0	0558	2107
20/20/17	07:00	65	1	0	0558	2107
20/20/17	08:00	63	1	0	0558	2107

Sky Code

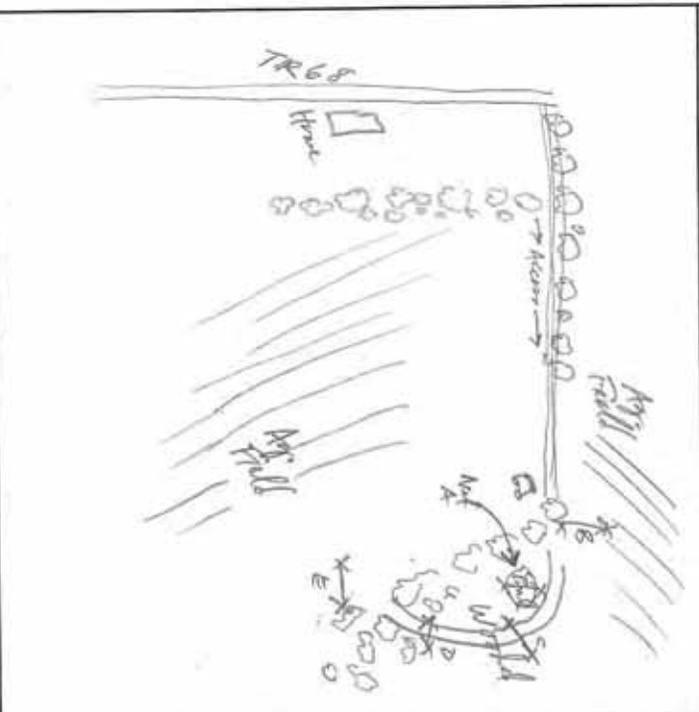
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale

0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Site No. BA3 Project Phase# 591.02 Project Name Apex Emission Cull Date 10/24/2006

Net Site Diagram



Net height x net length (m)		Dates					
A = 6.5	x 9.0	4/20	—				
B = 6.5	x 6.0*	4/20	4/24				
C = 6.5	x 6.0*	4/20	4/24				
D = 6.5	x 6.0	4/20	4/24				
E = 9.0	x 9.0	4/20	4/24				
F =	x						

Net Set GPS Location (UTM or Lat/Long)	
A = N41,1120	W 82,74923
B = N41,12241	W 82,74917
C = N41,12222	W 82,74886
D = N41,12189	W 82,74855
E = N41,12161	W 82,74864
F =	

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor			X			
Road Rut				X		
Creek						
River						
Pond		X				
Forest Gap						
Cave						
Mine						
Tree						
Other: list						
Edge	X					X

Dominant Vegetation	
1. <i>Acer rubrum</i>	5. <i>Cerfayus sp.</i>
2. <i>Quercus rubra</i>	6. _____
3. <i>Quercus velutina</i>	7. _____
4. <i>Carya glabra</i>	8. _____

Potential listed bat habitat at site:

1. **Roost habitat:** 1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

2. **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

3. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor): 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory cluter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

4. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: *BA3 info & C map for info, not for as stipulation. We have steel traps on 4/20*

Site No. E C 14 Project Phase# 591 D2 Project Name APPN Emerson Creek
 Site Location Dry stream bed through woodlot on Habitat Type* Cree/Pool/Paran
 County Harrison State OH Permit # 2 Bar Technician(s) Molly Gander
 Lat/Long or UTM (circle one): Easting 4111460 Northing -82,72977 UTM Zone 18Q Datum NA83 **COPPERHEAD**
 TRANSMIGRATOR ASSOCIATION

Tech. cont: Leanne Burns Sheet 1 of 1

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Freq.	Comments
1	22 Jun	22:37	EPFL	A	F	L	19.35	44	2	4	0			
2	22 Jun	23:20	EPFL	A	F	L	19.75	45	D	3	0			
3	22 Jun	23:50	EPFL	A	F	L	21.50	45	E	6.5	0			
4	22 Jun	01:10	EPFL	A	M	N	16.75	43	D	5	0			
5	22 Jun	01:45	EPFL	A	F	L	19.5	44	D	4	0			
6	22 Jun	01:45	EPFL	A	F	L	21.6	44	D	6	0			
7	22 Jun	02:08	EPFL	A	F	L	20.75	48.5	D	5	0			
1	23 July	23:15	EPFL	S	F	NR	13.6	48	D	4	0			

Species Abbreviations: *Corynorhinus rufescens* (CORV); *Corynorhinus t. virginianus* (COV); *Eptesicus fuscus* (EPFL); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus teminckii* (LASE); *Lasiurus noctivagus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis liliol* (MYLI); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodati* (MYSO); *Nyctinomus humeralis* (NYHU); *Perimyotis subflavus* (PRISU); *Tadarida brasiliensis* (TABR)
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

V Fracture (old scanning) left wing 5th digit
 *1 NITS protected NGT billowing

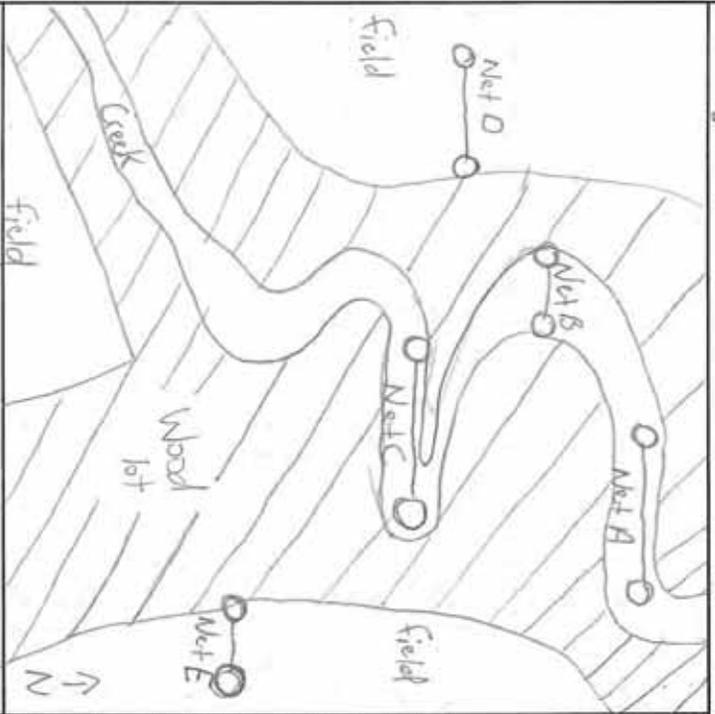
Copperhead Consulting Ph: 859-925-9012 Please return to: P.O. Box 73, Paint Lick, KY 40461

Date	Time	Temp (°F)	Sky	Wind	Comments
22 Jun	21:08	78	23	8-2	
22 Jun	21:08	77	2	2	R-2
22 Jun	23:08	75	1	3	" "
22 Jun	00:08	74	1	3	" "
22 Jun	01:04	73	0	2	" "
22 Jun	02:04	72	0	2	" "
23 July	21:08	69	1	0	
23 July	22:06	67	1	0	
23 July	23:06	66	3	0	
23 July	00:08	66	3	0	
23 July	01:02	66	2	0	
23 July	02:08	65	2	0	

Beaufort Wind Scale	
0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Sky Code	
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Site No. EC14 Project Name Apex Emerson Leed Dates 22 June 4, 03 July 17
 Project Phase# 591.01



Net height x net length (m)		Dates	Net Set by Habitat						
A = 5.2	x 9	22 June 17	Habitat	A	B	C	D	E	F
B = 5.2	x 6	22 June 3rd	Corridor						
C = 5.2	x 18	22 June 3rd	Road Rut						
D = 5.2	x 9	22 June 3rd	Creek	✓	✓	✓			
E = 9.8	x 9	22 June 3rd	River						
F =	x		Pond						
			Forest Gap						
			Cave						
			Mine						
			Tree						
			Other list						

Potential listed bat habitat at site:

Roost habitat: 1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.

Water Resources: 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road cuts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: Dropped Net A on July 3, 2017

Site No. EC15 Project Phase# 51L02 Project Name Apex Emerson Creek Dates 6/20/2017 + 6/22/17
 Site Location Shore Run south of Swann Norton rd. crossing Habitat Type* Creek/Riparian
 County Huron State OH Permittee P. Swall Technician(s) K. Dyer Datum NAD83
 Lat/Long or UTM (circle one) Easting 411413 Northing -8278085 UTM Zone 18Q

COPPERHEAD
 RESEARCH CORPORATION



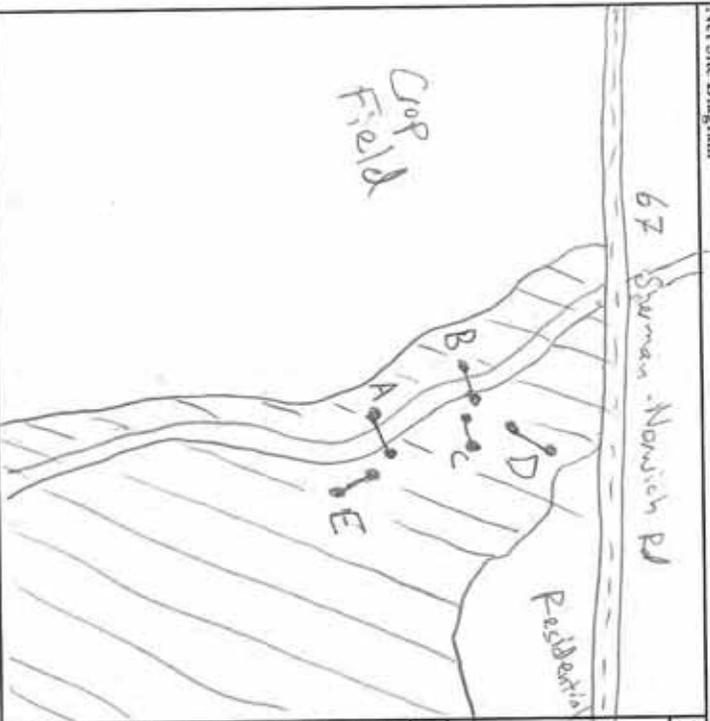
#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Freq.	Comments
1	6/20	2240	LABO	-	IM	-	-	-	B	4.5	-	-	-	Escape net
2	6/20	2320	LABO	A	F	L	12.25	40	A	0.5	0	-	-	-
1	6/22	2155	LABD	A	M	NR	11.5	40	R	1.5	0	-	-	-
1	6/22	2358	LABO	A	M	NR	11.5	40	B	0.5	0	-	-	-

Date	Time	Temp (°F)	Sky	Wind	Comments
6/20	2108	72	2	2	-
6/20	2208	68	2	1	-
6/20	2204	69	3	1	-
6/20	0008	64	1	0	-
6/20	0108	64	2	1	-
6/20	0208	63	2	0	-
6/22	2108	78	2	3	-
6/22	2208	78	3	2	-
6/22	2318	76	2	2	-
6/22	0008	75	2	3	-
6/22	0108	74	1	2	-
6/22	0208	73	1	2	-

Species Abbreviations: *Corynorhinus virginianus* (CORV); *Corynorhinus t. virginianus* (COVT); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasiurus noctivagus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis litoralis* (MYLI); *Myotis myotis* (MYMY); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Neotomas hammondi* (NYHM); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. ELL5 Project Name Apex Emerson Creek Dates 6/20 + 6/22

Project Phase# S91.02



Net height x net length (m)		Dates						
A = 5.2 x 9	6/20 + 6/20	Habitat	A	B	C	D	E	F
B = 5.2 x 6	6/20 + 6/20	Corridor						
C = 5.2 x 4	6/20	Road Rut						
D = 5.2 x 9	6/20 + 6/20	Creek	X	X				
E = 7.8 x 6	6/20 + 6/20	River						
F = x		Pond						
Net Set GPS Location (UTM or Lat/Long)		Forest Gap			X	X	X	
A = 41.14139	-82.78085	Cave						
B = 41.14160	-82.78124	Mine						
C = 41.14175	-82.78114	Tree						
D = 41.14207	-82.78104	Other list						
E = 41.14139	-82.78068							
F =								
Transmitters		Net Set by Habitat						
Band#	Band#							
Freq.	Freq.							
Brand	Brand							
Weight	Weight							
#days	#days							
		Dominant Vegetation						
		1. <u>A. argyrod</u> 5. <u>Melvin-Pom. S.</u>						
		2. <u>P. occidentalis</u> 6. _____						
		3. <u>Fraxinus sp.</u> 7. _____						
		4. <u>Asimina triloba</u> 8. _____						

Potential listed bat habitat at site:

2. **Roost habitat:** 1. **Poor:** No or few snags >= 5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

3. **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

2. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging. 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.

2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.

3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stream, fence row, or other wooded corridor.

Comments: Forest structure is a bit cluttered. Some snags are definitely present but could be better. Stream makes a nice corridor. Surprised not to see more activity.

Site No. EC16 Project Phase# 591.02 Project Name Apex Emulsion Creek Dates 6/21 / 6/24
 Site Location Tributary of Fink Run Mouth of Bismarck Rd Habitat Type* Creek / Riparian
 County Horton State OH Permittee P. Sewell / Zachary Technician(s) Ian Burns Datum NAD83
 Lat/Long or UTM (circle one): Easting 4116360 Northing -8727986 UTM Zone 18Q



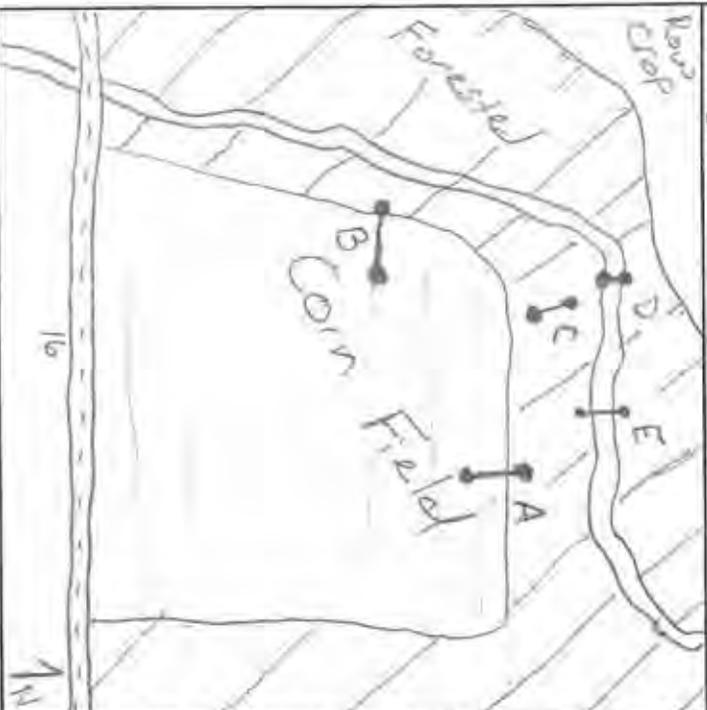
#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDL	Band#	Freq.	Comments
1	6/21	2130	LABO	A	F	L	10.25	34	E	3	0			
2	6/21	2130	EPFU	A	M	NR	13.75	49	E	5	0			
3	6/21	2145	EPFU	A	M	NR	12.75	47	E	4	0			
4	6/21	2210	EPFU	A	F	L	15.35	50	E	3	0			
5	6/21	2210	EPFU	A	M	NR	16.5	47	E	3	0			
6	6/21	2240	EPFU	A	F	L	16.0	46	A	3	0			
7	6/21	2245	EPFU	A	F	L	20.25	46	E	3	0			
8	6/21	2245	LABO	A	M	NR	10.75	37	E	3	0			
9	6/21	2355	EPFU	A	F	L	26.0	52	E	11.5	0			
10	6/21	0055	EPFU	A	F	L	24.25	57	E	4	0			
11	6/21	0115	EPFU	A	M	NR	16.25	50	A	3	0			
12	6/21	0120	EPFU	A	F	L	21.0	49	A	4	0			
13	6/21	0208	LABO	A	M	NR	-	40	B	3	0			
1	6/24	2130	LABO	A	F	L	14.5	43	A	5	0			
2	6/24	2130	LABO	A	F	L	13.0	41	E	2	0			
3	6/24	2130	LABO	A	F	L	12.25	40	B	4	0			
4	6/24	2150	LABO	A	M	N	12.25	39	A	3	0			
5	6/24	2150	EPFU	A	M	N	14.5	46	A	4.5	0			
6	6/24	2150	EPFU	A	F	L	17.25	50	E	3	0			
7	6/24	2220	EPFU	A	F	L	17.75	49	A	4	0			*
8	6/24	2220	LABO	A	M	N	12.5	41	B	4	0			
9	6/24	2245	EPFU	A	M	NR	16.5	47	E	2.5	0			
10	6/24	2255	EPFU	A	M	NR	16.0	46	B	4	0			
11	6/24	2300	EPFU	A	E	L	21.25	49	A	5	0			**
12	6/24	2300	EPFU	A	F	L	19.5	46	A	6	0			
13	6/24	2330	EPFU	A	M	NR	15.75	48	A	3.5	0			
14	6/24	2340	LABO	A	M	N	12.75	41	E	4.5	0			

Species Abbreviations: *Corynorhinus rafinesquii* (CORR); *Corynorhinus t. virginianus* (COVR); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus semiostris* (LASI); *Lasiurus noctrogarus* (LANO); *Myotis austroriparius* (MAUR); *Myotis grisescens* (MYGR); *Myotis lbtbi* (MYLE); *Myotis lasiopus* (MYLA); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctinomus laticaudus* (NYTL); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

* Recapture of bat #12 from 6-21 / ** = recapture from 6-21

Site No. ELL6 Project Phase# 59L02 Project Name Apple Emerson Creek Dates 6/21, 6/24

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat						
A = 7.9 x 9		6/21, 6/24	Habitat	A	B	C	D	E	F
B = 5.2 x 9		6/21, 6/24	Corridor						
C = 5.2 x 6		6/21, 6/24	Road Run						
D = 5.2 x 4		6/21	Creek				X	X	
E = 5.2 x 6		6/21, 6/24	River						
F = x			Pond						
Net Set GPS Location (UTM or Lat/Long)			Forest Gap			X			
A = 41.16760		-82.79986	Cave						
B = 41.16714		-82.80059	Name						
C = 41.16760		-82.80052	Tree						
D = 41.16778		-82.80071	Other list						
E = 41.16771		-82.80040	Field	X	X				
F =									
Transmitters			Dominant Vegetation						
Band#		Band#	1. <u>A. negundo</u>	5. _____					
Freq.		Freq.	2. <u>J. nigra</u>	6. _____					
Brand		Brand	3. <u>Q. alba</u>	7. _____					
Weight		Weight	4. <u>Maclura pumila</u>	8. _____					
#days		#days							

Potential listed bar habitat at site:

2. **Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

3. **Water Resources:** 1. **Poor:** but drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road runs) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

2. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor)

1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

1. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.

2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.

3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: Pike Small Renette on 6/21, Zack Beck on 6/24

Site No. EC16 (continued) Project Phase# 591.02 Project Name AREX EMERSON CREEK Dates 6/21, and 6/24

Net Site Diagram

SEE DATA SHEET FROM 6/21/2017

Net height x net length (m)		Dates					
A =	x						
B =	x						
C =	x						
D =	x						
E =	x						
F =	x						

Net Set GPS Location (UTM or Lat/Long)		Net Set by Habitat						
A =		Habitat	A	B	C	D	E	F
B =		Corridor						
C =		Road Rut						
D =		Creek						
E =		River						
F =		Pond						
		Forest Gap						
		Cave						
		Mine						
		Tree						
		Other list						

Transmitters		Dominant Vegetation							
Band#	Band#	1	2	3	4	5	6	7	8
Freq.	Freq.								
Brand	Brand								
Weight	Weight								
#days	#days								

Potential listed bat habitat at site:

Roost habitat: 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

Water Resources: 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road cuts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC17 Project Phase# 591.02 Project Name AREX Emerson Creek Dates 20 Aug - 21 May 17
 Site Location Wooden Stream west Heyman Rd south Bismark Rd Habitat Type* Creek/Riparian
 County Harro State OH Permittee Zack Baer Technician(s) Molly Goeden, J. Velsir, B. Ulls
 Lat/Long or UTM (circle one): (N/Easting 41.16255 (W/Northing -82.80721) UTM Zone 18N) Datum NAD 83



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDL	Band#	Freq.	Comments
1	20 Jun	2130	LABO	A	F	PL	12.75	41	B	2	0			
2	20 Jun	2130	LABO	A	M	N	10.5	39	C	1	0			
3	20 Jun	2155	EPFU	A	M	N	15.5	46	B	1	0-P			*
4	20 Jun	2310	LABO	A	F	PL	13.75	41	C	1	0			
5	20 Jun	0050	EPFU	A	M	N	16.75	46	B	3	0			
1	21 Jun	2245	CACI	A	F	L	29.5	56.5	C	5	0			
2	21 Jun	28:00	LABO	A	M	N	19.5	39	C	1	0			
3	21 Jun	05:05	ABO	A	F	L	14.5	34	C	1	0			
4	21 Jun	0050	LABO	A	M	N	13.25	38.5	E	3	0			

Species Abbreviations: *Corynorhinus rufescens* (CORR); *Corynorhinus t. rufescens* (COVR); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASI); *Lasiurus naevius* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis liliolus* (MYLI); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctinomus bohemius* (NYBO); *Nyctinomus phyllotis* (NYPH); *Perimyotis subflavus* (PISU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

* 4th digit has old fracture

Date	Time	Temp (°F)	Sky	Wind	Comments
20 Jun	2108	66	3	2	
20 Jun	2208	65	3	1	
20 Jun	2308	64	4	1	
20 Jun	0008	63	2	1	
20 Jun	0108	62	3	0	
20 Jun	0208	62	3	0	
21 Jun	0109	64	3	0	
21 Jun	2209	61	2	1	
21 Jun	2309	59	1	1	
21 Jun	0009	58	0	0	
21 Jun	0109	57	0	0	
21 Jun	0209	56	0	1	

Sky Code	Beaufort Wind Scale
0	Calms <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Site No. EC17 Project Phase# 591.02 Project Name APEX Emerision Creek Dates 20+2022 June 14

Net Site Diagram



Net height x net length (m)		Dates		Net Set by Habitat								
A =	B =	C =	D =	E =	F =	Habitat	A	B	C	D	E	F
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	Field						
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	Woods						
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	Stream						
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	Road						
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	Creek						
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	River						
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	Pond						
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	Forest Gap						
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	Cave						
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	Mine						
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	Tree						
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	Other list						
6.1 x 6	6.1 x 6	6.1 x 6	6.1 x 9	7.5 x 9	x	Elge						X

Net Set GPS Location (UTM or Lat/Long)

A = 41.16755	-82.80721
B = 41.16283	-82.80687
C = 41.16323	-82.80665
D = 41.16349	-82.80669
E = 41.16372	-82.80638
F =	

Transmitters

Band#	Band#
_____	_____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____

Dominant Vegetation

1. <u>Alnus americana</u>	5. _____
2. <u>Acer negundo</u>	6. _____
3. <u>Quercus rubra</u>	7. _____
4. <u>Malva parvifera</u>	8. _____

Potential listed bat habitat at site:

2. **Roost habitat:** 1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.

3. **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. If ways to resources are available.

2. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restrict flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC18 Project Phase# 9A1.07 Project Name ADP EMERSON TRAIL Dates 20+23 JUNE 17
 Site Location Woodlot West of Heyman Woods of Panther Section Line E1 (W) Habitat Type* Upland Forest +
 County HUNN State OH Permittee P. Roby Technician(s) Leann Burns / Matt Seale - Dark Bait
 Lat/Long or UTM (circle one): N Easting 41.17245 W Northing 12.81506 Datum NAD83 UTM Zone 18Q



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Freq	Comments
1	20 June	21:58	EPFU	A	F	L	18.5	43	A	3	8			
2	21	22:21	EPFU	A	F	P	22.75	47	A	5	8			photos
3	21	23:16	EPFU	A	F	P	21.5	44	A	4.5	8			
			23 June											

Date	Time	Temp (°F)	Sky	Wind	Comments
20 June	21:00	108	3	2	
21	22:00	64	3	1	
21	23:00	64	3	0	
21	00:00	60	2	0	
21	01:00	60	2	0	
21 June	21:00	61	1	0	
21	22:00	59	1	0	
21	23:00	57	0	0	
21	00:00	57	1	1	
21	01:00	56	0	0	
21	02:00	54	0	0	

Sky Code	0	1	2	3	4	5	6
0	Clear						
1	Very Cloudy						
2	Partly Cloudy						
3	Cloudy or overcast						
4	Fog or smoke						
5	Drizzle or light rain						
6	Heavy rain - thunder storm						

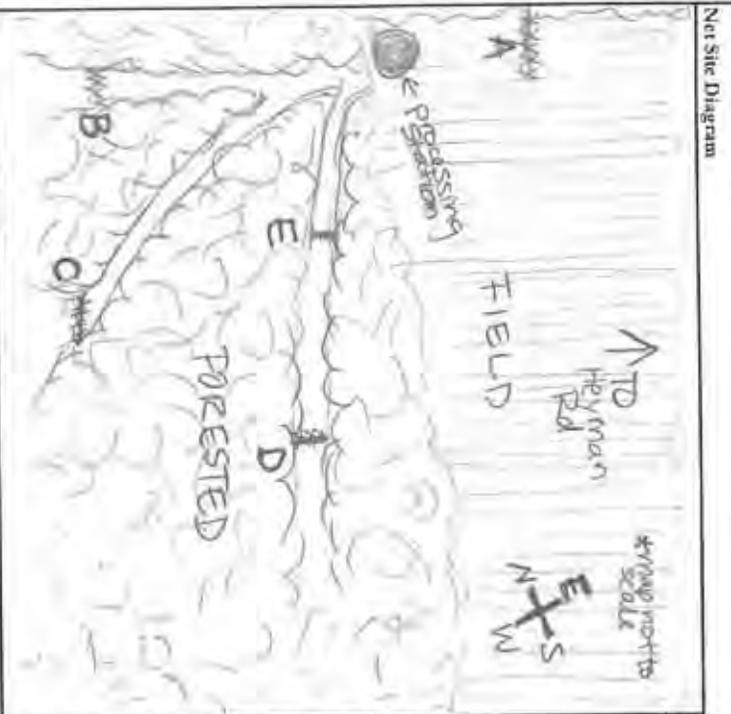
Beaufort Wind Scale	0	1	2	3	4
0	Calm <1 mph				
1	Light air 1-3 mph				
2	Light breeze 4-6 mph				
3	Gentle breeze 7-10 mph				
4	Moderate breeze 11-16 mph				

Species Abbreviations: *Corynorhinus rafinesquii* (CORV); *Caryaculicetus v. virginianus* (CCV); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LASC); *Lasiurus teminckii* (LASE); *Lasiurus noctivagus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis liliol* (MYLI); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctinomus lumsdeni* (NYLU); *Peromyscus rubifrons* (PRSU); *Tadarida brasiliensis* (TABB)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. EC19 Project Phase# 591.02 Project Name APX ENVIRONMENTAL Date 20 & 27 JUNE 17



Net height x net length (m)	Dates	Net Set by Habitat					
		A	B	C	D	E	F
A = 7.8 x 9	20 & 27 JUNE						
B = 5.2 x 6	20 & 27 JUNE		X				
C = 5.2 x 9	20 & 27 JUNE			X			
D = 5.2 x 6	20 & 27 JUNE				X		
E = 5.2 x 6	20 & 27 JUNE					X	
F = x							

Net Set GPS Location (UTM or Lat/Long)	Dominant Vegetation
A = 41,172,40	1. <i>Acer saccharum</i> 5
B = 41,172,45	2. <i>Quercus palustris</i> 6
C = 41,171,84	3. <i>Populus deltoides</i> 7
D = 41,171,74	4. <i>Tilia americana</i> 8
E = 41,172,16	
F =	

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

Potential listed bat habitat at site:

1. **Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

2. **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road cuts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

3. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging. 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

4. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC19 Project Phase# 591.02 Project Name Aper Emerson Creek Dates 29 June 01 July
 Site Location Shelby Co. TN State OH Permitte Zack Brier Technician(s) Tom Burns, Kirk Decker, Will Goshen, Kober Bism Habitat Type* Eastwood Forest
 County Hancock State OH UTM Easting 9117017 UTM Northing 8277835 UTM Zone 18N Datum NAD 83
 * **COPPERHEAD**
 CONSERVATION ASSOCIATION

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Freq.	Comments
1	29 Jun	NO	EA	TS										
2	1 Jul	NO	EA	TS										

Date	Time	Temp (°F)	Sky	Wind	Comments
29 Jun	08:08	75	5	2	
29 Jun	10:08	68	2	2	
29 Jun	12:08	67	0	0	
29 Jun	01:08	68	1	0	
29 Jun	03:08	69	3	2	
29 Jun	05:08	70	3	2	
29 Jun	07:08	75	0	0	
29 Jun	09:08	71	0	1	
29 Jun	11:08	69	0	1	
29 Jun	13:08	69	5	1	
29 Jun	15:08	68	0	1	

Species Abbreviations: *Corynorhinus raphanognathus* (CORR); *Corynorhinus l. virginianus* (COVL); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus semihirsutus* (LASE); *Lasiurus noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis thibet* (MYTL); *Myotis lasiopterus* (MYLO); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctalexis humeralis* (NYHU); *Perimyotis subflavus* (PEFL); *Tadarida brasiliensis* (TABR)
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Sky Code

0	Clear
1	few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale

0	Calm <1 mph
1	Light air 1-3 mph
2	Light breeze 4-6 mph
3	Gentle breeze 7-10 mph
4	Moderate breeze 11-16 mph

26 June 17 - 15 minutes rain delay

Site No. EC20 Project Phase# 591102 Project Name Apoc Emulsion Creek Dates 21-26 June 17
 Site Location Tells through mature wooded south of Brel Road Habitat Type* Bottomland forest
 County Huron State OH Permit # 2 Repr DP Technician(s) DP
 Lat/Long UTM (circle one): Easting 41.18962 Westing 82.75497 UTM Zone 18 Datum NAD83



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Freq.	Comments
1	21 Jun	2150	EPFU	A	M	N	15.5	47	A	3	0			
2	21 Jun	2320	EPFU	A	F	L	19.5	48	A	4	0			some wing speckling
3	21 Jun	0020	EPFU	A	M	N	13.25	45	E	5	0			
4	21 Jun	0020	EPFU	A	M	N	15.5	47	B	3	0			*
1	26 Jun	0230	LABO	A	M	N	13.0	39	E	4	0			

Date	Time	Temp (°F)	Sky	Wind	Comments
21 Jun	2100	68	0	0	
21 Jun	2208	68	0	0	
21 Jun	2308	67	2	0	
21 Jun	0000	67	0	0	
21 Jun	0100	67	0	0	
21 Jun	0208	67	3	0	
26 Jun	0100	55	5	2	*
26 Jun	0208	54	3	1	
26 Jun	0308	53	2	0	
26 Jun	0408	52	1	0	
26 Jun	0508	55	3	0	
26 Jun	0208	54	0	2	

Species Abbreviations: *Corynorhinus virginianus* (CORV); *Corynorhinus t. virginianus* (COVT); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus semiholarus* (LASP); *Lasiurus noctivagus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis labii* (MYLB); *Myotis lasiargus* (MYLA); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humerilis* (NYHU); *Permyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

Habitat Type: Crock/tparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

* recapture of Bat # 1

0	1	2	3	4	5	6
Clear	Few Clouds	Partly Cloudy	Cloudy or overcast	Fog or smoke	Drizzle or light rain	Heavy rain - thunder storm

0	1	2	3	4
Calm: <1 mph	Light air: 1-3 mph	Light breeze: 4-6 mph	Gentle breeze: 7-10 mph	Moderate breeze: 11-16 mph

Net Site Diagram



Net height x net length (m)	Dates
A = 5.2 x 12	21 st July 17
B = 5.2 x 9	21 st July 17
C = 5.2 x 6	21 st July 17
D = 5.2 x 6	21 st July 17
E = 7.8 x 9	21 st July 17
F = _____ x _____	

Net Set GPS Location (UTM or Lat/Long)	
A = 41.189662	-82.75497
B = 41.18936	-82.75454
C = 41.189118	-82.75449
D = 41.19009	-82.75443
E = 41.19017	-82.75423
F = _____	

Transmitters	
Band# _____	Band# _____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor		✓				
Road Rut			✓			
Creek						
River						
Pond						
Forest Gap	✓					
Cave						
Mine						
Tree						
Other: list					Field edge	

- Dominant Vegetation**
1. *Carya ovata*
 2. *Acer saccharum*
 3. *Ulmus americana*
 4. *Tilia americana*
 5. *Fagus grandifolia*
 6. *Ostrya virginiana*
 7. _____
 8. _____

Potential listed bat habitat at site:

1. **Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

1. **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

3. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging
 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare.
 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
1. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC23 Project Phase# PH1.02 Project Name Apex Emerson Creek Date 22 & 26 June 17
 Site Location Creek West of Dogwood Rd. North of Breit Rd. Habitat Type* Creek/Riparian
 County HAWKIN State OH Permit # P. 19004 Technician(s) Leanne
 Lat/Lon or UTM (circle one) N/Easting 4119929 W/Northing 82710884 UTM Zone 18Q
 Datum NAD83



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	REA (mm)	Net	Height (m)	WDI	Band#	Freq.	Comments
1	22 June	03:00	LAG	A	F				E	0				ESAPD
2	22 June	03:00	EPFU	A	F				B	2				ESAPD
	22 June		N	O										

Date	Time	Temp (°F)	Sky	Wind	Comments
22 June	2100	79	5	2	
22 June	2200	77	2	2	
22 June	2300	76	2	3	
22 June	0000	75	2	4	
22 June	0100	74	1	3	
22 June	0200	72	1	1	
22 June	2100	55	3	2	
22 June	2200	54	5	0	
22 June	2300	54	2	0	
22 June	0000	53	1	0	
22 June	0100	53	1	2	
22 June	0200	53	1	2	

Species Abbreviations: *Corynorhinus virginianus* (CORV); *Corynorhinus t. virginianus* (COV); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus semiholaris* (LASE); *Lasiurus noctivagus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis litoralis* (MYLI); *Myotis lasiurus* (MYLA); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctaleus borealis* (NYBO); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. EL 23 Project Phase# 591 02 Project Name APPX IMPROVEMENTS Dates 22-2-26 June 17

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat									
A	B	C	D	E	F							
A = 5.2 x 4	B = 5.2 x 6	C = 5.2 x 9	D = 5.2 x 9	E = 7.8 x 9	F =	Habitat	A	B	C	D	E	F
Net Set GPS Location (UTM or Lat/Long)						Corridor						
A = 41,19929	B = 41,19929	C = 41,19964	D = 41,19972	E = 41,19976	F =	Road Run						
Transmitters						Creek	X	X	X			
Band#	Band#	Freq.	Brand	Weight	#days	River						
Band#	Band#	Freq.	Brand	Weight	#days	Pond						
Weight	Weight					Forest Gap				X		
#days	#days					Cave						
						Mine						
						Tree						
						Other 1st						
						Dominant Vegetation						
						1. <i>VIMUS AMERICANA</i>	5					
						2. <i>MACULATA POMIFERA</i>	6					
						3. <i>SCROFAGEUS SPP.</i>	7					
						4. _____	8					

Potential listed bat habitat at site:

1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.

1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road cuts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC94 Project Phase# 591.02 Project Name APPE Emerson Creek Park Dates 21-23 July 2017
 Site Location Small woodlot near the top of hills surrounding Frick Run west of 30N Habitat Type* Bottomland Forest
 County Huron State OH Permittee J. Hopkins Technician(s) A. Wolke Datum WGS 84
 Lat./Long or UTM (circle one): N/Easting 41,9100 (W) Northing 82,7889 UTM Zone 18



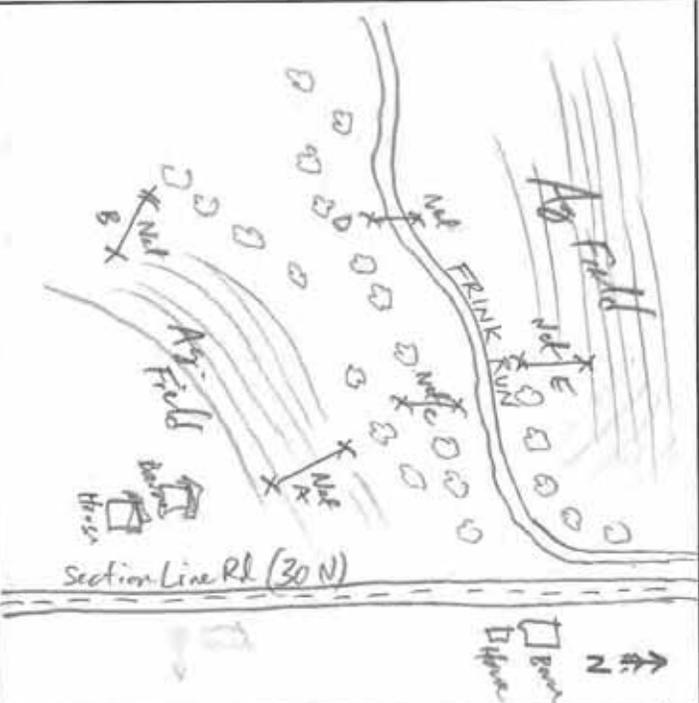
#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Freq.	Comments
1	6/21/17	2215	EPFU	A	M	N	17.0	45	D	2.5	0	---	---	---
2	6/21/17	2300	EPFU	A	P	L	20.0	44	D	5.0	0	---	---	---
3	6/21/17	0100	EPFU	A	F	F	22.0	47	D	5.0	0	---	---	---
1	6/22/17	0150	LANO	A	F	L	16.0	40	D	3.0	0	---	---	---

Species Abbreviations: *Corynorhinus ruficapillus* (CORN); *Corynorhinus t. virginianus* (COVN); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus semivolaris* (LASL); *Lasiurus noctrogarus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis labii* (MYLB); *Myotis lasiopterus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctinomus humeralis* (NYHU); *Perimyotis subflavus* (PISU); *Tadarida brachyotus* (TABR)
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Non Repro: N; Unknown: U
Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Date	Time	Temp (°F)	Sky	Wind	Comments
21 Jul 2017	2100	70	1	0	---
21 Jul 2017	2200	64	1	0	---
21 Jul 2017	2300	64	2	0	---
21 Jul 2017	0200	64	3	0	---
21 Jul 2017	0100	64	3	0	---
22 Jul 2017	2100	70	3	2	---
22 Jul 2017	2200	69	3	1	---
22 Jul 2017	2300	69	3	1	---
22 Jul 2017	0000	69	2	2	---
22 Jul 2017	0100	66	0	1	---

Sky Code	Beaufort Wind Scale
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat									
A	B	C	D	E	F	Habitat	A	B	C	D	E	F
A = 9.0 x 9.0	B = 6.5 x 9.0	C = 6.5 x 6.0	D = 6.5 x 6.0	E = 6.5 x 9.0	F =	Corridor						
						Road Rut						
						Creek				X		
						River						
						Pond						
						Forest Gap			X			
						Cave						
						Mine						
						Tree						
						Other list					X	
						Edge	X	X				

Dominant Vegetation

- 1. *Salix bicolor*
- 2. *Taxus pennsylvanica*
- 3. *Thuja nigra*
- 4. *Carya sp.*
- 5. *Acer rugosa*
- 6. *Norx alba*
- 7. *Ulmus rubra*
- 8. _____

Potential listed bar habitat at site:

Roost habitat: 1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.

Water Resources: 1. **Poor:** bar drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC25 Project Phase# 391.02 Project Name Apur Eastern Forest Dates 2 July to 17 July 17
 Site Location Woodlot 081 N of Camp-Hill Rd. State OH Permit # 5 T Special Technician(s) D-V Date / Leave BY NRNS
 County Warren State OH UTM Easting 411313337 UTM Northing 82129998 UTM Zone 18Q Datum NAD 83
 Car/Load or UTM (circle one): Easting Northing



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RPA (mm)	Net	Height (m)	WDI	Band#	Freq.	Comments
1	22-Jul	22:30	EPFU	A	M	NR	16.5	46.0	F	2.5	0-P			Collected for genetic analysis
2	1-Jul	01:20	EPFU	A	M	NR	18.5	46.0	D	1.5	0			
3	1-Jul	01:20	EPFU	A	F	L	17.0	46.0	F	3.5	0			
4	1-Jul	02:00	EPFU	A	F	L	21.5	42.0	E	4.5	0			
5	1-Jul	02:00	EPFU	A	F	L	18.0	45.0	E	3.0	0			
6	1-Jul	02:17	VPFU	A	M	NR	15.0	43.0	D	2.5	0			

Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
22-Jul	3	04:51	19:51	05:59	21:07
1-Jul	54	14:18	02:07	06:02	21:08

Date	Time	Temp (F)	Sky	Wind	Comments
22-Jul	21:01	79	3	1	
22-Jul	22:07	77	2	1	
22-Jul	23:00	75	2	2	
22-Jul	00:00	75	1	2	
22-Jul	01:01	74	1	1	
22-Jul	02:01	73	0	1	
1-Jul	21:08	76	1	0	
1-Jul	22:08	73	1	0	
1-Jul	23:04	71	0	0	
1-Jul	00:08	70	0	2	
1-Jul	01:08	69	0	0	
1-Jul	02:08	69	0	0	

Sky Code	
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale	
0	Calm: <1 mph
1	Light air: 1-5 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Species Abbreviations: *Corynorhinus virginianus* (CORV); *Corynorhinus t. virginianus* (COVT); *Epitaxius fuscus* (EPFU); *Lanius borealis* (LABO); *Lanius excubitorides* (LAEX); *Lanius ludovicianus excubitorides* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis velox* (MYVL); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctaleis borealis* (NYBU); *Periptychus unifasciatus* (PUSU); *Tadarida borealis* (TABR)
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. EC-35 Project Phase# 59102 Project Name Apple Farm - Creek Dates 22 June 15, 10 July 17

Net Site Diagram



Net height x net length (m)		Dates					
A = 5.2	x 12.0	22 June 15, 10 July 17					
B = 5.2	x 12.0	22 June 15, 10 July 17					
C = 5.2	x 9.0	22 June 17					
D = 5.2	x 6.0	22 June 17					
E = 2.0	x 4.0	22 June 17					
F =	x						

Net Set GPS Location (UTM or Lat/Long)	
A = 41,137,260	-82,824552
B = 41,138,382	-82,829452
C = 41,138,938	-82,829250
D = 41,138,947	-82,828931
E = 41,138,833	-82,830087
F =	

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

	Net Set by Habitat					
	A	B	C	D	E	F
Habitat						
Corridor						
Road Run						
Creek						
River						
Pond						
Forest Gap	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Cave						
Mine						
Tree						
Other list					Field site	Field site

Dominant Vegetation	
1. <u>Quercus rubra</u>	5. _____
2. <u>Fagus grandifolia</u>	6. _____
3. <u>Carya ovata</u>	7. _____
4. <u>Rhus glabra</u>	8. _____

Potential listed bat habitat at site:

1. Roost habitat: 1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

2. Water Resources: 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road cuts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

3. Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor)
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

4. Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: Removed net C on July 1 2017

Site No. EC26 Project Phase# 591.02 Project Name Apep Peninsula Creek Dates 23 + 28 June 17
 Site Location Wardlot West of Section Line R130 N Range S12R16 & 17 Habitat Type* Upland forest
 County Wyo State OH Permit # P. Kuhn Technician(s) Leanne Burns
 Lat/Long or UTM (circle one): N/Easting 4115591 W/Westing 8278991 UTM Zone 18Q Datum NAD83



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	REB (mm)	Net	Height (m)	WDL	Band#	Freq.	Comments
1	23 June	21:57	EPFU	A	M	NR	18.0	48	E	4	Ø			
2		22:40	EPFU	A	F	L	15.25	46	E	1	Ø			photos
3		22:40	EPFU	A	M	NR	17.5	46	E	3	Ø			
4		22:46	EPFU	A	F	P	20.0	43	E	2.5	Ø			
5		22:52	EPFU	A	F	L	17.0	43	E	4	Ø			
6		23:28	EPFU	A	F	L	13.75	48	E	6	Ø			
7		20:00	EPFU	A	M	NR	18.0	48	E	4	Ø			Vegetation
1	28 June	22:20	LABO	A	M	NR	13.25	40	E	2	Ø			photos
2		22:20	EPFU	A	F	L	13.5	49	E	6	Ø			
3		22:50	EPFU	A	F	L	18.0	46	E	5	Ø			
4		22:50	EPFU	A	F	L	19.25	47	E	7	Ø			
5		22:57	EPFU	A	F	L	18.0	46	E	3.5	Ø			
6		23:07	EPFU	A	M	NR	15.5	44	A	4	Ø			
7		23:40	EPFU	A	F	L	17.25	43	E	6.5	Ø			Vegetation - 15:45 from 23 June
8		23:40	EPFU	A	M	NR	17.5	47	E	3.5	Ø			

Species Abbreviations: *Corynorhinus rufescens* (COR); *Ceryle alcyon* (COV); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus zosterus* (LZOS); *Lanius borealis* (LANB); *Lanius ludovicianus excubitorides* (LANL); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis lucifugus* (MYLU); *Myotis myotis* (MYMY); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius borealis* (NYBO); *Peromyscus subflavus* (PESU); *Tadarida brasiliensis* (TABR).
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Date	Time	Temp (°F)	Sky	Wind	Comments
23 June	21:00	68	3	Ø	
28 June	22:00	68	3	Ø	
	22:00	67	3	Ø	
	22:05	67	3	Ø	
	21:05	64	Ø	Ø	
	22:00	62	Ø	Ø	
	21:00	71	3	Ø	
	20:00	68	2	Ø	
	23:00	67	1	Ø	
	00:00	66	1	Ø	
	01:00	67	2	Ø	
	02:00	67	1	Ø	

Sky Code

0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale

0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Site No. EC26 Project Phase# 59102 Project Name Apex Emerson Brook Dates 23 + 28 Nov 17
 Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat						
A = 5.2 x 6	23 + 28 Nov		Habitat	A	B	C	D	E	F
B = 5.2 x 6	23 + 28 Nov		Corridor						
C = 5.1 x 9	23 + 28 Nov		Road Run						
D = 5.1 x 9	23 Nov		Creek						
E = 7.8 x 9	23 + 28 Nov		River						
F = x			Pond						
Net Set GPS Location (UTM or Lat/Long)			Forest Gap	X	X	X	X		
A = 41.15559	-82.78976		Cave						
B = 41.15574	-82.79007		Mire						
C = 41.15591	-82.78996		Tree						
D = 41.15618	-82.78974		Other list						
E = 41.15646	-82.78931								
F =									
Transmitters			Dominant Vegetation						
Band#	Band#	Freq.	Band#	Freq.	Band#	Freq.	Band#	Freq.	Band#
Brand	Brand	Weight	Brand	Weight	Brand	Weight	Brand	Weight	Brand
Weight	Weight	#days	Weight	Weight	Weight	Weight	Weight	Weight	Weight
#days	#days		Weight	Weight	Weight	Weight	Weight	Weight	Weight

Potential based bat habitat at site:

Roost habitat: 1. **Poor** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

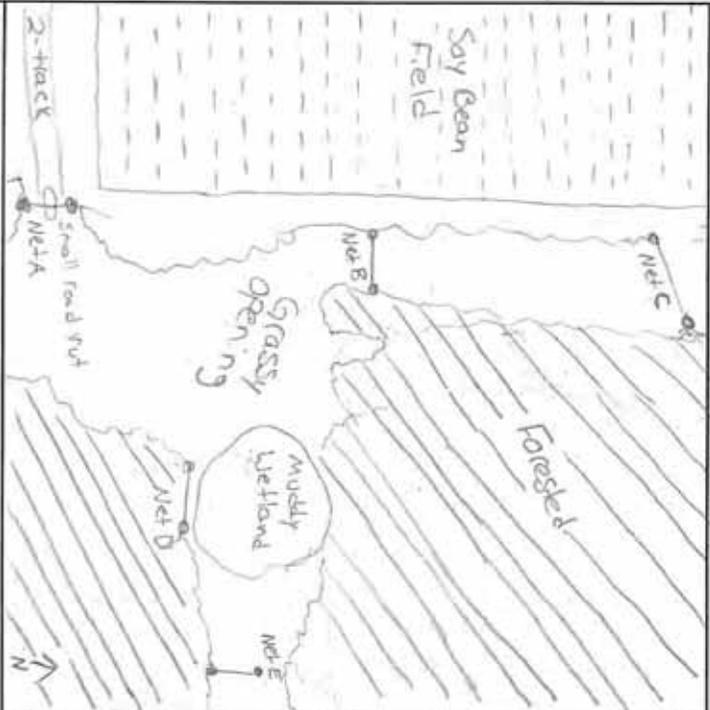
Water Resources: 1. **Poor** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road runs) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging. 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat						
A = 5.2	x 6	6/21, 6/28	Habitat	A	B	C	D	E	F
B = 5.2	x 6	6/21, 6/28	Corridor	✓	✓	✓	✓	✓	
C = 5.2	x 12	6/21, 6/28	Road Rut						
D = 5.2	x 9	6/21	Creek						
E = 7.2	x 9	6/21, 6/28	River						
F =	x		Pond						
Net Set GPS Location (UTM or Lat/Long)			Forest Gap						
A = 41.11034		-82.74742	Cave						
B = 41.11090		-82.74728	Mine						
C = 41.11125		-82.74724	Tree						
D = 41.11034		-82.74674	Other list						
E = 41.11035		-82.74639							
F =									

Potential listed bat habitat at site:

- Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

- Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

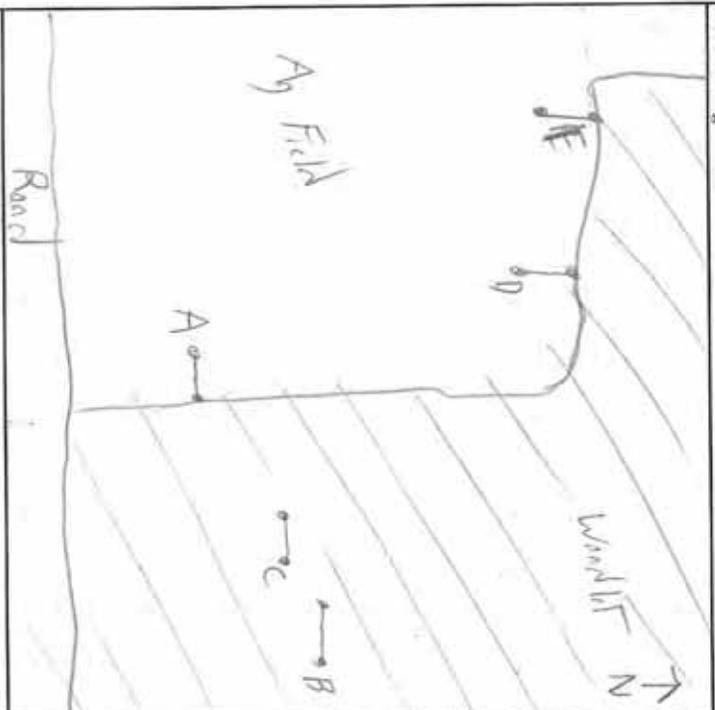
- Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor); 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

- Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC 28 Project, Phase# 591.02 Project Name Area Emmons Creek Dates 6/25, 7/2

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat						
A = 5.2	x 12	6/25	Habitat	A	B	C	D	E	F
B = 7.8	x 9	6/25, 7/2	Corridor		X				
C = 5.2	x 6	6/25, 7/2	Road Run						
D = 5.2	x 12	6/25, 7/2	Creek						
E = 5.2	x 9	6/25, 7/2	River						
F =	x		Pond						
Net Set GPS Location (UTM or Lat/Long)			Forest Gap			X			
A = 41,18013		-82,77986	Cave						
B = 41,18023		-82,77990	Mine						
C = 41,18008		-82,77909	Tree						
D = 41,18105		-82,78603	Other list	Elk				Elk	Elk
E = 41,18111		-82,78078	Dominant Vegetation						
Transmitters			1. <u>R. Verticillata</u>	5. _____					
Band# _____	Band# _____	Band# _____	2. <u>A. Sordidum</u>	6. _____					
Freq. _____	Freq. _____	Freq. _____	3. <u>V. American</u>	7. _____					
Brand _____	Brand _____	Brand _____	4. _____	8. _____					
Weight _____	Weight _____	Weight _____							
#days _____	#days _____	#days _____							

Potential listed bat habitat at site:

- Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

- Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road runs) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

- Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
- Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC29 Project Phase# 91102 Project Name Apex Emission Catch Dates 6/21, 6/26
 Site Location Slate Run creek north of Old Military Rd State OH Permittee G. Jones Technician(s) W. Schirmer Habitat Type* Woods
 County Huron State OH UTM Easting 4113206 UTM Northing 8279243 UTM Zone 18N Datum NAD83



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Freq.	Comments
1	6/21	2250	FFV	A	F	NR	1635	47	B	3	0			
2	6/21	2315	EPFU	A	F	L	20.5	48	B	5	0			
	6/26		NO											
			BATS											

Species Abbreviations: *Corynorhinus rufiginosus* (COR-V); *Corynorhinus t. niphlinus* (COV-I); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASI); *Lasiurus noctivagus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis labii* (MYLB); *Myotis lasiurus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctinomus humeralis* (NYHU); *Penthyotis niphlinus* (PINSU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Date	Time	Temp (°F)	Sky	Wind	Comments
6/21	2107	64	3	0	
6/21	2207	63	3	0	
6/21	2307	64	3	0	
6/21	0007	63	3	0	
6/21	0107	63	3	0	
6/21	0207	63	2	0	
6/26	2107	55	3	3	10 min off perch
6/26	2207	55	3	1	
6/26	2307	55	1	1	
6/26	0007	55	2	2	
6/26	0107	55	2	3	
6/26	0207	55	4	2	

Sky Code	Beaufort Wind Scale
0	Calms: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Site No. EC29 Project Phase# 51102 Project Name Apex Emerson Creek Dates 6/21, 6/26

Net Site Diagram



Net height x net length (m)		Dates					
A = 5.2	x	q	6/21, 6/26				
B = 7.8	x	6	6/21, 6/26				
C = 5.2	x	6	6/21, 6/26				
D = 5.2	x	6	6/21, 6/26				
E = 5.2	x	q	6/21, 6/26				
F =	x						

Net Set GPS Location (UTM or Lat/Long)	
A = 41, 13152	-82, 79277
B = 41, 13206	-82, 79254
C = 41, 13206	-82, 79243
D = 41, 13259	-82, 79227
E = 41, 13263	-82, 79186
F =	

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Habitat						
Corridor					X	
Road Rut						
Creek	X				X	X
River						
Pond						
Forest Gap		X				
Cave						
Mine						
Tree						
Other list	Rock					

Dominant Vegetation	
1. <i>Osgce Orange</i>	5
2. <i>Jugland nigra</i>	6
3. <i>Platanus occidentalis</i>	7
4. <i>Carya ovata</i>	8

Potential listed bat habitat at site:

1. **Roost habitat:** 1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.

3. **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road cuts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

2. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging
 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare.
 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
 2. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC30 Project Phase# 591.02 Project Name APEX Emerson Creek Dates 21 June 2017
 Site Location Creek, woodlot trails and Ag field west of CR 30 Habitat Type* Creekside/riparian
 County Huron State OH Permittee T. Culbertson Technician(s) M. Hinds
 Lat/Long or UTM (circle one): (N) Easting 4120332 (W) Northing -8278045 UTM Zone 18ADQ3 Datum NAD83



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Freq.	Comments
1	21 June 2017	2203	LABO	-	-	-	-	-	C	4	-	-	-	W/Escap
2	21 June 2017	2350	LABO	-	-	-	-	-	A	2	-	-	-	Net Escap
3	21 June 2017	2152	LACI	A	F	L	30+	56	C	3 1/2	0	-	-	Scale moved
1	27 June 2017	2220	LACI	A	F	L	2875	57	A	2	0	-	-	-
2	27 June 2017	2337	LACI	A	F	L	30+	57	A	6	0	-	-	Scale moved

Species Abbreviations: *Corynorhinus rufescens* (CORV); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LANSE); *Lasiurus noctivagus* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis liliif* (MYLI); *Myotis lasiocarpus* (MYLA); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctinomus humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR).
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Date	Time	Temp (°F)	Sky	Wind	Comments
21 June 2017	2108	67	1	0	-
"	2208	67	3	0	-
"	2305	66	3	0	-
"	0008	66	3	0	-
"	0108	65	3	0	-
"	0206	64	3	0	-
"	2107	64	2	0	-
"	2207	63	1	0	-
"	2307	61	1	0	-
"	0007	60	2	0	-
"	0107	60	2	0	-
"	0207	59	2	0	-

Sky Code	Beaufort Wind Scale
0	Calms < 1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Site No. EC30 Project Phase# 591.02 Project Name APER Emerson Cree k Dates 21 June 2017, 27 June 2017

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat										
A	B	C	D	E	F	Habitat	A	B	C	D	E	F	
A = 7.8 x 9	B = 5.2 x 12	C = 5.2 x 9	D = 5.2 x 6	E = 5.2 x 6	F = x	Corridor		X					
						Road Rut							
						Creek			X				
						River							
						Pond							
						Forest Gap				X		X	
						Cave							
						Mine							
						Tree							
						Other list							
						Dominant Vegetation							
							1. <i>Quercus palustris</i>						
							2. <i>Aesculus glabra</i>						
							3. <i>Carya ovata</i>						
							4. <i>Sugher nigra</i>						
							5. _____						
							6. _____						
							7. _____						
						8. _____							

Potential listed bat habitat at site:

3 **Roost habitat:** 1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

3 **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road runs) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

3 **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 13" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2 **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC 31 Project Phase# 591.03 Project Name Apex Emission Creek Dates 21 June, 2 July 2017
 Site Location Intersection ditch right of way State OH Permittee S. Samocky, Zack Baer Technician(s) Molly Gooden Habitat Type* Field edge
 County Huron Lat/Lon or UTM (circle one): (N) Easting 41,095,674 (W) Northing 42,921,604 UTM Zone 18N Datum NAD83 COPPERHEAD
 RECREATION LABORATORY

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDL	Band#	Freq.	Comments
1	21 Jun	2130	LARB	A	F	-	-	-	B	5.0	-	ESCAPE	NET	-
2	21 Jun	2145	EPFD	A	F	L	15.25	47.0	B	4.5	0	-	-	-
3	21 Jun	2215	EPFU	A	F	L	19.5	46.0	A	7.0	0	-	-	-
4	21 Jun	2215	EPFU	A	M	N	14.0	45.0	A	1.0	0	-	-	-
5	21 Jun	2215	EPFU	A	M	N	15.5	45.0	B	5.0	0	-	-	-
6	21 Jun	2250	EPFU	A	F	L	21.5	46.0	B	3.5	0	-	-	-
7	21 Jun	2320	EPFU	A	F	L	19.5	46.0	B	5.0	0	-	-	cecropole
8	21 Jun	2320	EPFU	A	F	L	19.75	49.0	A	6.0	0	-	-	-
9	21 Jun	0010	EPFU	A	F	L	21.0	46.0	B	3.0	0	-	-	cecropole
1	2 Jul	2205	LARB	A	F	L	13.75	40.0	B	3.0	0	-	-	-
2	2 Jul	2235	EPFU	A	F	L	20.25	48.0	B	4.0	0	-	-	-
3	2 Jul	2255	EPFU	A	F	L	18.25	45.0	A	5.5	0	-	-	-
4	2 Jul	2310	EPFU	A	M	N	17.25	44.0	A	2.5	1-P	-	-	*
5	2 Jul	2325	EPFU	A	M	N	17.5	46.0	A	3	0	-	-	-
6	2 Jul	0050	EPFU	A	F	L	23.5	49.0	A	3	0	-	-	-
7	2 Jul	0120	EPFU	A	M	N	17.5	49.0	B	4	0	-	-	-

Species Abbreviations: *Corynorhinus virginianus* (CORV); *Corynorhinus t. virginianus* (COVT); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus semiostris* (LASL); *Lasiurus nachtergae* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis lbtbi* (MYLT); *Myotis lasiopterus* (MYLT); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctinomus laticaudus* (NYLU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

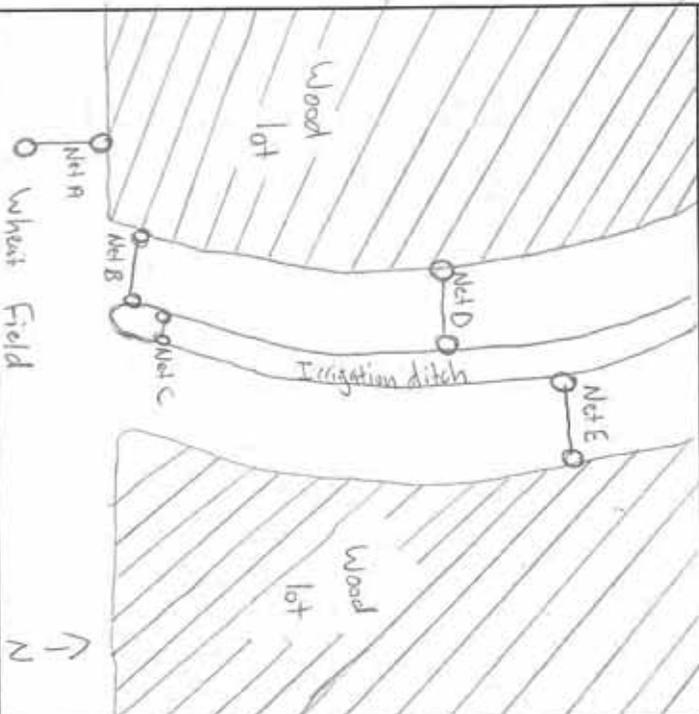
* Habitat Type: Creek/riparian; Bortoland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

* ID num have in right wing between 5th digit and body

Date	Time	Temp (°F)	Sky	Wind	Comments
6-21	2108	71	2	0	-
6-21	2204	66	2	0	-
6-21	2308	67	3	0	-
6-21	0008	67	3	0	-
6-21	0108	67	3	0	-
6-21	0206	66	3	0	-
6-21	2107	93	1	2	-
6-21	2207	71	2	1	-
6-21	2307	71	2	0	-
6-21	0007	70	3	1	-
6-21	0107	70	3	1	-
6-21	0207	70	3	1	-

Sky Code	Beaufort Wind Scale
0	Caln: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat						
A = 7.8	x 9	21 Jun '2017	Habitat	A	B	C	D	E	F
B = 5.2	x 9	21 Jun '2017	Corridor						
C = 2.6	x 4	21 Jun '2017	Road Rut						
D = 5.2	x 6	21 Jun '2017	Creek			X			
E = 5.2	x 9	21 Jun '2017	River						
F =	x		Pond						
			Forest Gap						
Net Set GPS Location (UTM or Lat/Long)			Gave						
A = 41.095764		-82.821734	Mine						
B = 41.095674		-82.821504	Tree						
C = 41.059907		-82.821463	Other: list						
D = 41.076451		-82.821616	Field edge	X	X		X	X	
E = 41.096646		-82.821264							
F =									
Transmitters			Dominant Vegetation						
Band#		Band#	1. <u>Ulmus alba</u>						
Freq.		Freq.	2. <u>Quercus alba</u>						
Brand		Brand	3. <u>Acer spicatosum</u>						
Weight		Weight	4. <u>Tilia americana</u>						
#days		#days							

Potential listed bat habitat at site:

- Roost habitat:** 1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.

- Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

- Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging. 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging. 2. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC34 Project Phase# 531.02 Project Name Upper Emerson Creek Date 22, 29 June 2017
 Site Location 41E Riv. south of PAVE station Rd Technician(s) W. S. Pr Habitat Type* Creek/Recreation
 County Howa State OH Permit# 663005 LTM Zone U3 Datum NAD 83 Date MAD 83
 Lar/Limpr LTM (circle one): N/Easting 4118049 W/Northing -8275337 LTM Zone U3 Date MAD 83



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Freq.	Comments
1	6/22	2215	EPFU	A	F	L	20.0	46	A	5	0			
2	6/22	2230	EPFU	A	M	NR	16.0	47	C	3	0			
3	6/22	2430	EPFU	A	M	NR	16.0	46	C	5	0			
4	6/22	2545	EPFU	A	M	NR	12.5	48	D	5	0			
5	6/22	0605	LACT	A	F	L	30+	54	A	5	0			
6	6/22	0615	EPFU	A	F	L	18.75	48	C	5	0			
7	6/22	0605	EPFU	A	F	L	20.25	47	D	3	0			
8	6/22	0105	EPFU	A	F	L	23.25	50	A	3	0			
9	6/22	0125	LACT	A	F	L	30+	56	A	4	0			
1	6/28	2310	EPFU	A	F	L	27.5	46	D	4	0			
2	6/28	2230	EPFU	A	F	L	18.5	43	D	2	0			
3	6/28	2250	LACT	A	F	NR	23.0	55	A	7	0			
4	6/28	2305	EPFU	A	F	L	19.0	48	D	3	0			
5	6/28	2340	EPFU	A	F	L	19.25	46	D	1	0			
6	6/28	0000	LACT	A	F	L	30+	58	D	5	0			
7	6/28	0100	LACT	A	F	L	14.25	41	C	0.5	0			
8	6/28	0101	EPFU	A	M	NR	16.0	45	A	3.5	0			
9	6/28	0155	EPFU	A	M	NR	17.5	49	D	2	0			

Date	Time	Temp (°F)	Sky	Wind	Comments
6/22	10	0450	1991	0558	2107
6/22	25	1111	0002	0600	2107
6/28	2107	77	3	3	
6/28	2107	75	3	2	
6/28	2507	75	0	3	
6/28	0007	73	1	3	
6/28	0107	72	1	2	
6/28	0207	72	0	1	
6/28	2107	70	3	0	
6/28	2207	68	3	0	
6/28	2307	66	3	0	
6/28	0007	64	1	1	
6/28	0107	64	5	2	
6/28	0207	66	2	2	

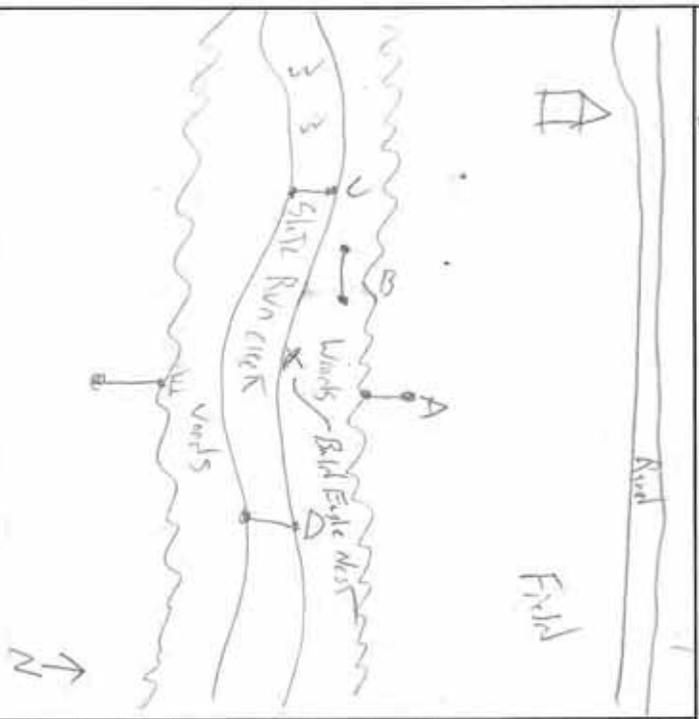
Species Abbreviations: *Caryocroant nigricauda* (CORN); *Caryocroant v. virginiana* (COVT); *Epiplatys fuscus* (EPFU); *Latinus borealis* (LABO); *Latinus tanzania* (LACT); *Latinus tenuicollis* (LASE); *Latinus tenebrosus* (LANO); *Myotis austroriparius* (MAAU); *Myotis grisescens* (MYGR); *Myotis helix* (MYHE); *Myotis longicaudus* (MYLD); *Myotis septentrionalis* (MYSE); *Myotis velox* (MYVO); *Nyctinomus borealis* (NYBO); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. EC34 Project Phase# 591102 Project Name Apex Emerson Verts Dates 6/22/17, 6/28/2017

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat						
A = 7.8	x 9	6/22, 6/28	Habitat	A	B	C	D	E	F
B = 9.2	x 9	6/22, 6/28	Corridor		X				
C = 5.2	x 9	6/22, 6/28	Road Rut						
D = 5.2	x 12	6/22, 6/28	Creek			X		X	
E = 5.2	x 9	6/22, 28/17	River						
F =	x		Pond						
Net Set GPS Location (UTM or Lat/Long)			Forest Gap						
A = 41,18060		-92,75219	Cave						
B = 41,16058		-92,75325	Mine						
C = 41,16091		-92,75357	Tree						
D = 41,18019		-92,75288	Other: list						
E = 41,16004		-92,75212							
F =									
Transmitters			Dominant Vegetation						
Band#	Freq.	Brand	Weight	#days	Band#	Freq.	Brand	Weight	#days
1. A1					1. A1				
2. P2					2. P2				
3. A1					3. A1				
4. U. Americana					4. U. Americana				

Potential listed bat habitat at site:

1. **Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

2. **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

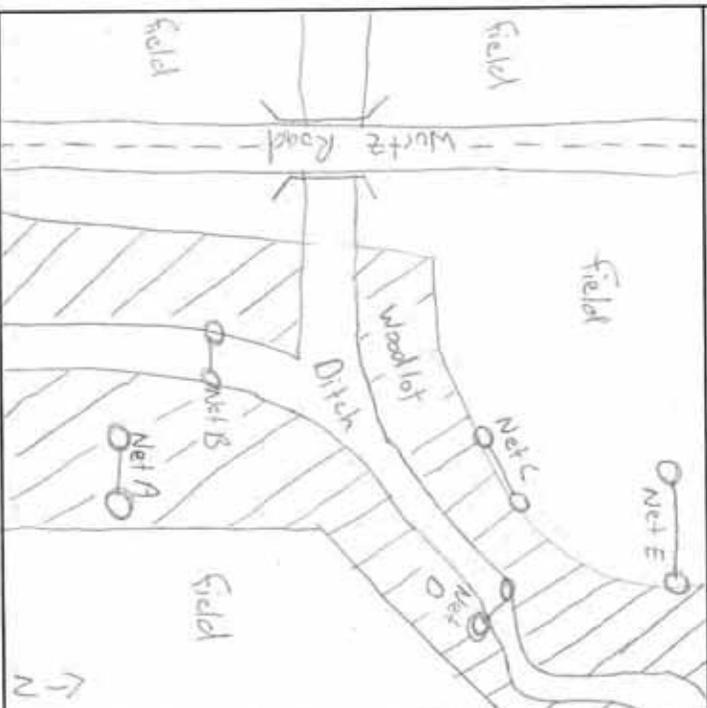
3. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor), 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging. 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: Blk Edge Nest on property

Site No. EC35 Project Phase# 511.02 Project Name Alex Emerson Creek Dates 23 - June 2017, 2 July 2017

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat										
A	B	C	D	E	F	Habitat	A	B	C	D	E	F	
A = 5.2	x	6					Forest Gap			X			
B = 5.2	x	4					Cave						
C = 9.8	x	9					Mine						
D = 5.2	x	6					Tree						
E = 5.2	x	9					Other list						
F =	x						Edge					X	

Net Set GPS Location (UTM or Lat/Long)	
A = 41,06298	-82.81474
B = 41,08309	-82.81488
C = 41,08350	-82.81474
D = 41,08364	-82.81447
E = 41,08377	-82.81441
F =	

Transmitters	
Band#	Band#
Freq.	Freq.
Brand	Brand
Weight	Weight
#days	#days

Potential listed bat habitat at site:

1. Roost habitat: 1. Poor: No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

2. Water Resources: 1. Poor: bat drinking resources not present at the site. **2. Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

2. Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). **1. Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging. **2. Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

1. Land Cover: 1. Poor: Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. **2. Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. **3. Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. EC36 Project Phase# 591.08 Project Name Apex Emulsion Creek Dates 27-29 Jun 2017
 Site Location Slate Run creek south of Dogtown Rd State OH Permit# 5krw590001763 Technician(s) Apply Gordon & K. Meyer & D. Lutz
 County Huron State OH Permit# 5krw590001763 Technician(s) Apply Gordon & K. Meyer & D. Lutz
 Lat/Long or UTM (circle one): N/Easting 41.15667 W/Northing 8271600 UTM Zone 18 Datum NAD 83



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band#	Freq.	Comments
1	27 Jun	21:45	EPFV	A	M	NR	15.25	47	A	3	0			
2	27 Jun	22:15	EPFV	A	E	L	18	46	C	3	OP			
3	27 Jun	22:35	EPFV	A	F	PL	16.75	46	D	0	0			
4	27 Jun	00:00	LACI	A	M	NR	30.0	53	D	1	0			
5	27 Jun	01:45	LACI	A	F	L	30.0	55	A	3	0			
1	29 Jun	22:35	EPFU	A	F	PL	22.0	49.0	A	2.5	0			
2	29 Jun	23:25	EPFU	A	F	L	24.0	46.0	C	0.5	0			

Date	Time	Temp (F)	Sky	Wind	Comments
27 Jun	21:07	57	B	0	
27 Jun	22:07	61	1	0	
27 Jun	23:07	59	0	0	
27 Jun	00:07	57	0	0	
27 Jun	01:07	57	0	0	
27 Jun	02:07	55	0	0	
27 Jun	21:07	71	5	2	
27 Jun	22:07	68	0	0	
27 Jun	23:07	67	0	0	
29 Jun	00:07	62	0	0	
29 Jun	01:07	67	2	0	
29 Jun	02:07	64	2	1	

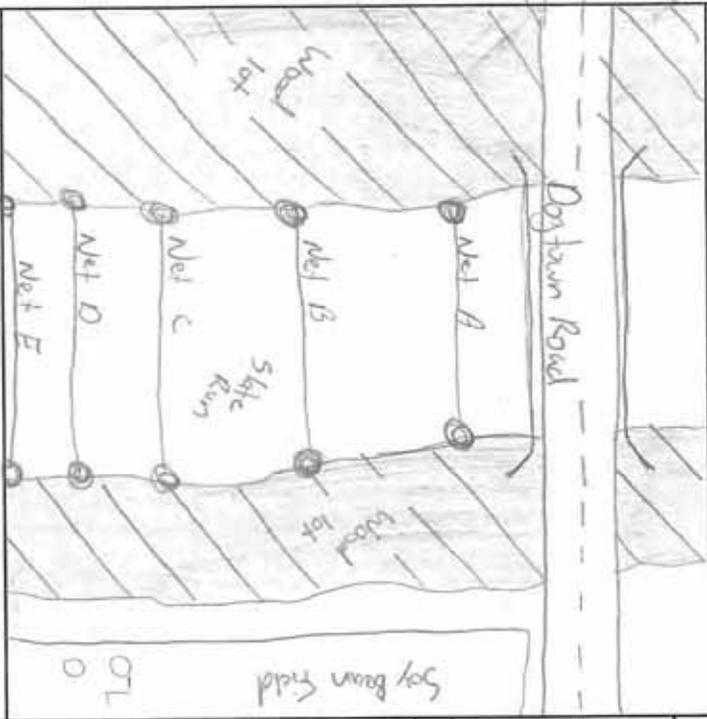
Species Abbreviations: *Corynorhinus nycturgus* (CORNY); *Corynorhinus t. virginianus* (COVTD); *Eptesicus fuscus* (EPFUD); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasiurus noctivagus* (LANO); *Myotis austroriparius* (MYAUA); *Myotis grisescens* (MYGR); *Myotis luteiventris* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nyctaleis borealis* (NYHUB); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

*** Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Sky Code	Beaufort Wind Scale
0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Net Site Diagram



Net height x net length (m)		Dates	Net Set by Habitat									
A	B	C	D	E	F	Habitat	A	B	C	D	E	F
A = 78	x 9	27 Jun, 29 Jun				Corridor						
B = 2.6	x 12	28 Jun				Road Rut						
C = 5.2	x 9	27 Jun, 29 Jun	X	X	X	Creek	X	X	X	X	X	X
D = 5.2	x 12	27 Jun, 29 Jun				River						
E = 5.2	x 12	27 Jun, 29 Jun				Pond						
F =	x					Forest Gap						
Net Set GPS Location (UTM or Lat/Long)			Dominant Vegetation									
A =	41.15667	-82.76606	1. <u>Platanus occidentalis</u> 5. <u>Morus americana</u>									
B =	41.15629	-82.76581	2. <u>Populus deltoides</u> 6. _____									
C =	41.15593	-82.76582	3. <u>Acer saccharum</u> 7. _____									
D =	41.15572	-82.76585	4. <u>Celtis occidentalis</u> 8. _____									
E =	41.15534	-82.76562	Other: list _____									
F =												
Transmitters												
Band#	Band#											
Freq.	Freq.											
Brand	Brand											
Weight	Weight											
#days	#days											

Potential listed bat habitat at site:

1. **Roost habitat:** 1. **Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

3. **Water Resources:** 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

2. **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging
 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare.
 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2. **Land Cover:** 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: 29-5 use, remove 2 with B

Site No. EC37 Project Phase# 591.02 Project Name Appa Emmon Creek Dates 22 June + 2 July 2017

Net Site Diagram



Net height x net length (m)			Dates	Net Set by Habitat						
A = 7.8	x	7	25 Jun 2017	Habitat	A	B	C	D	E	F
B = 5.2	x	6	23 Jun 2017	Corridor	<input checked="" type="checkbox"/>					
C = 5.2	x	6	23 Jun 2017	Road Rut						
D = 5.2	x	9	23 Jun 2017	Creek						
E = 2.6	x	6	23 Jun 17	River						
F =	x			Pond						
				Forest Gap						
Net Set GPS Location (UTM or Lat/Long)				Cave						
A = 91,175,692			-82,817,632	Mine						
B = 41,175,878			-82,817,777	Tree						
C = 41,174,483			-82,818,851	Other list						
D = 41,174,981			-82,818,352							
E = 41,174,681			-82,817,632							
F =										

Potential listed bat habitat at site:

Roost habitat: 1. **Poor:** No or few snags > ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. **Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. **Optimal:** Snags with sloughing bark or other roost features present > ~15 inch DBH within 1000 feet of forested areas.

Water Resources: 1. **Poor:** bat drinking resources not present at the site. 2. **Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. **Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor);
 1. **Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. **Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. **Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

Land Cover: 1. **Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
 2. **Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
 3. **Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

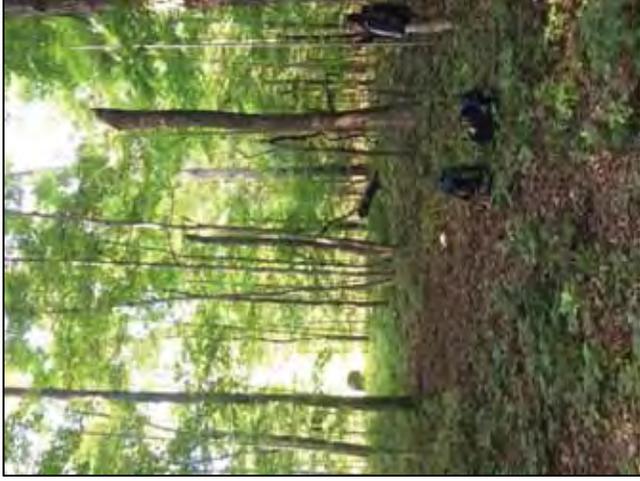
Comments: Removed Net E on July 2

APPENDIX B

Mist-Net Site Photographs



Site EC01 Net A



Site EC01 Net B



Site EC01 Net C



Site EC01 Net D



Site EC01 Net E



Site EC02 Net A



Site EC02 Net B



Site EC02 Net C



Site EC02 Net D



Site EC02 Net E



Site EC03 Net A



Site EC03 Net B



Site EC03 Net C



Site EC03 Net D



Site EC03 Net E



Site EC04 Net A



Site EC04 Net B



Site EC04 Net C



Site EC04 Net D



Site EC04 Net E



Site EC05 Net A



Site EC05 Net B



Site EC05 Net C



Site EC05 Net D



Site EC05 Net E



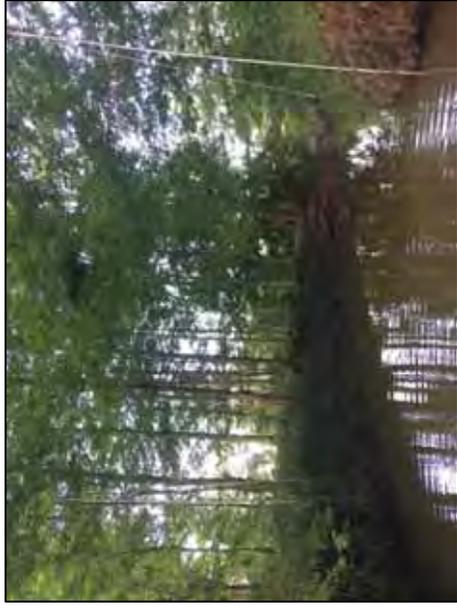
Site EC06 Net A



Site EC06 Net B



Site EC06 Net C



Site EC06 Net D



Site EC06 Net E



Site EC07 Net A



Site EC07 Net B



Site EC07 Net C



Site EC07 Net D



Site EC07 Net E



Site EC08 Net A



Site EC08 Net B



Site EC08 Net C



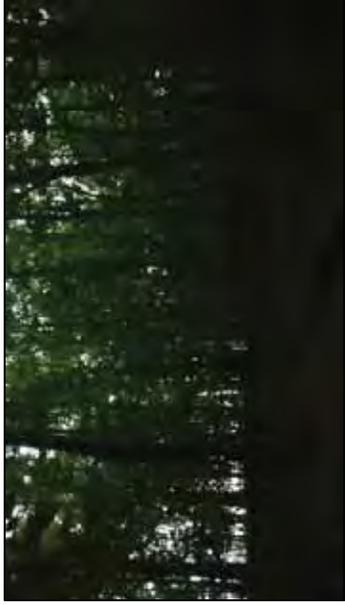
Site EC08 Net D



Site EC08 Net E



Site EC09 Net A



Site EC09 Net B



Site EC09 Net C



Site EC09 Net D



Site EC09 Net E



Site EC10 Net A



Site EC10 Net B



Site EC10 Net C



Site EC10 Net D



Site EC10 Net E



Site EC11 Net A



Site EC11 Net B



Site EC11 Net C



Site EC11 Net D



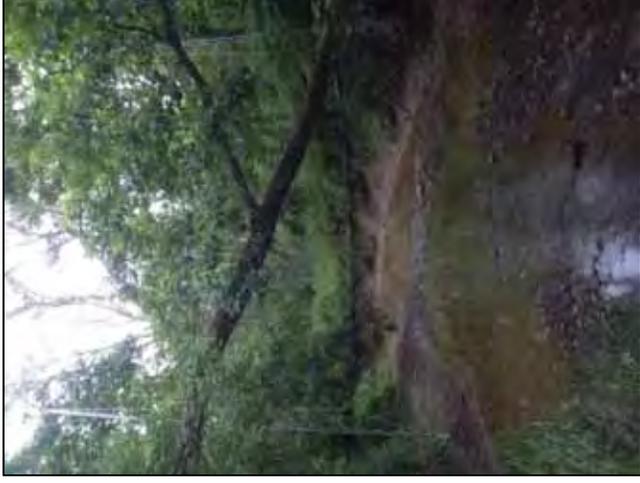
Site EC11 Net E



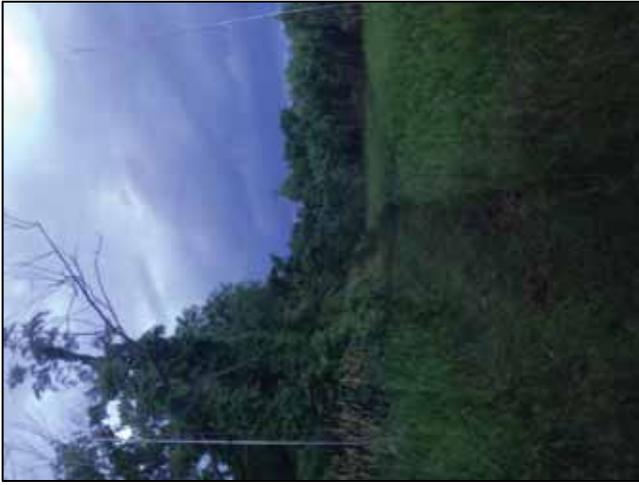
Site EC12 Net A



Site EC12 Net B



Site EC12 Net C



Site EC12 Net D



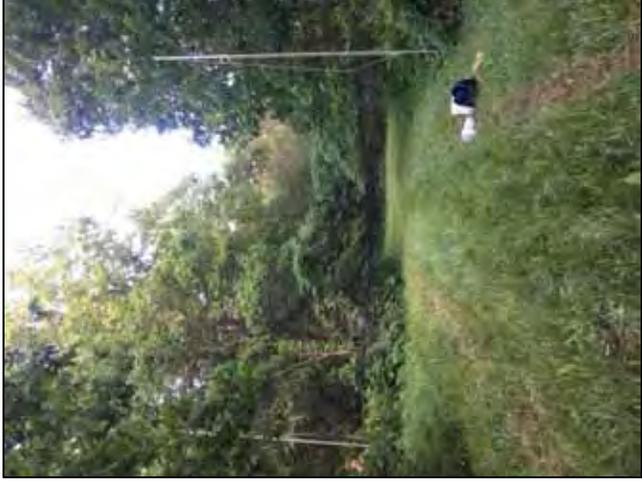
Site EC12 Net E



Site EC13 Net A



Site EC13 Net B



Site EC13 Net C



Site EC13 Net D



Site EC13 Net E



Site EC14 Net A



Site EC14 Net B



Site EC14 Net C



Site EC14 Net D



Site EC14 Net E



Site EC15 Net A



Site EC15 Net B



Site EC15 Net C



Site EC15 Net D



Site EC15 Net E



Site EC16 Net A



Site EC16 Net B



Site EC16 Net C



Site EC16 Net D



Site EC16 Net E



Site EC17 Net A



Site EC17 Net B



Site EC17 Net C



Site EC17 Net D



Site EC17 Net E



Site EC18 Net A



Site EC18 Net B



Site EC18 Net C



Site EC18 Net D



Site EC18 Net E



Site EC19 Net A



Site EC19 Net B



Site EC19 Net C



Site EC19 Net D



Site EC19 Net E



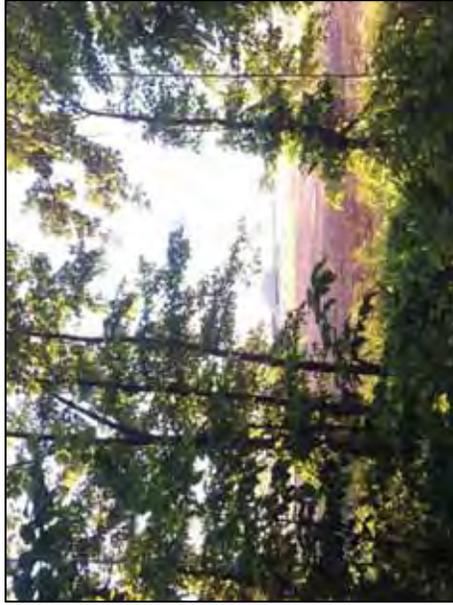
Site EC20 Net A



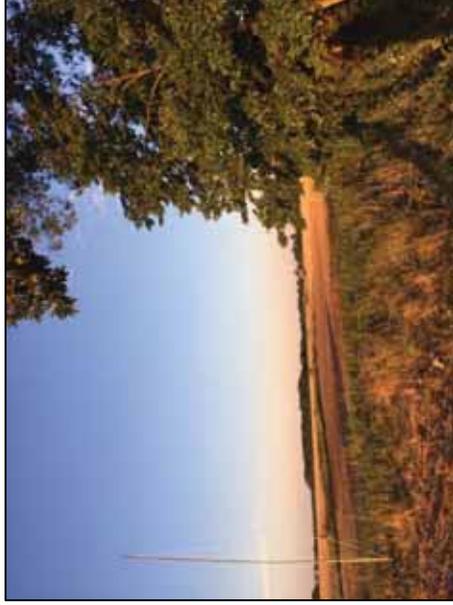
Site EC20 Net B



Site EC20 Net C



Site EC20 Net D



Site EC20 Net E



Site EC23 Net A



Site EC23 Net B



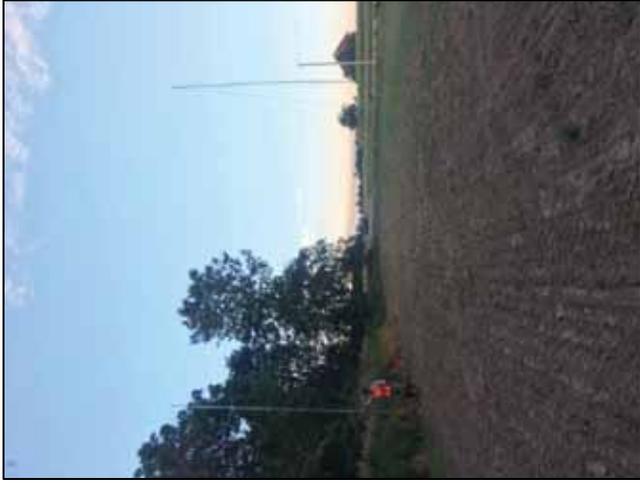
Site EC23 Net C



Site EC23 Net D



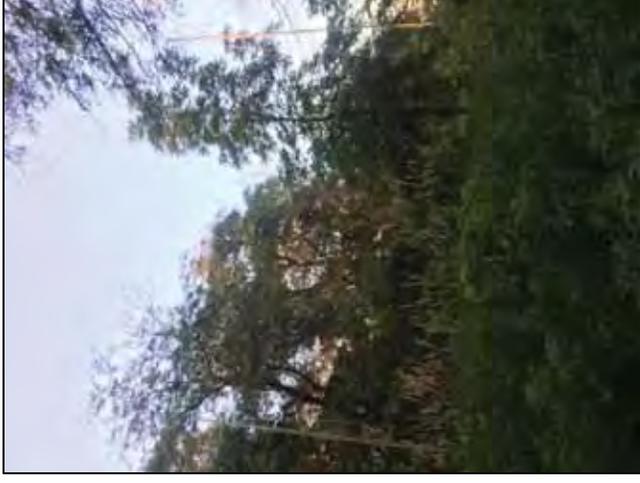
Site EC23 Net E



Site EC24 Net A



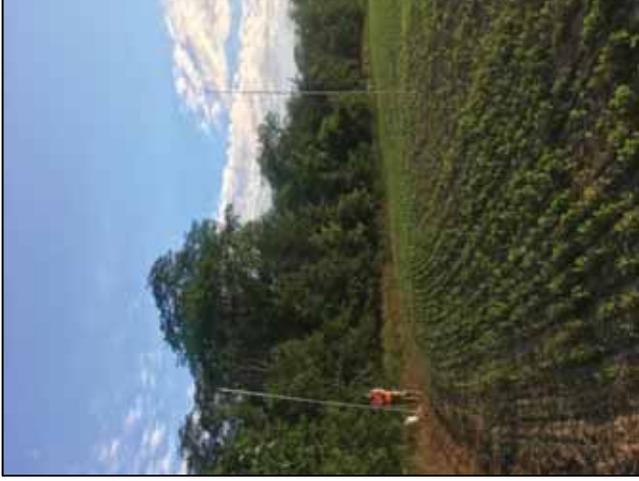
Site EC24 Net B



Site EC24 Net C



Site EC24 Net D



Site EC24 Net E



Site EC25 Net A



Site EC25 Net B



Site EC25 Net C



Site EC25 Net D



Site EC25 Net E



Site EC26 Net A



Site EC26 Net B



Site EC26 Net C



Site EC26 Net D



Site EC26 Net E



Site EC27 Net A



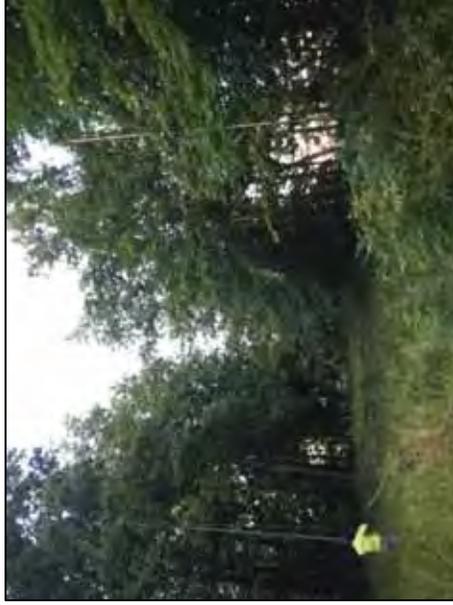
Site EC27 Net B



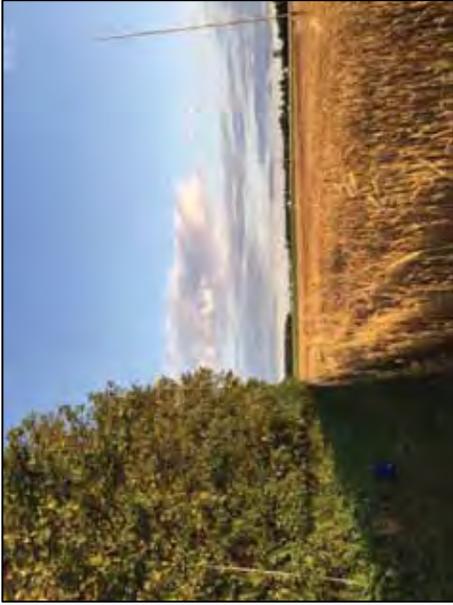
Site EC27 Net C



Site EC27 Net D



Site EC27 Net E



Site EC28 Net A



Site EC28 Net B



Site EC28 Net C



Site EC28 Net D



Site EC28 Net E



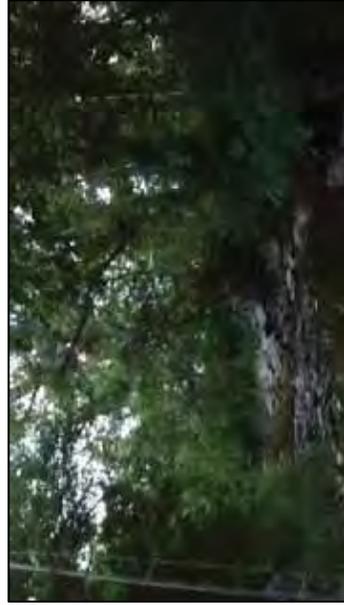
Site EC29 Net A



Site EC29 Net B



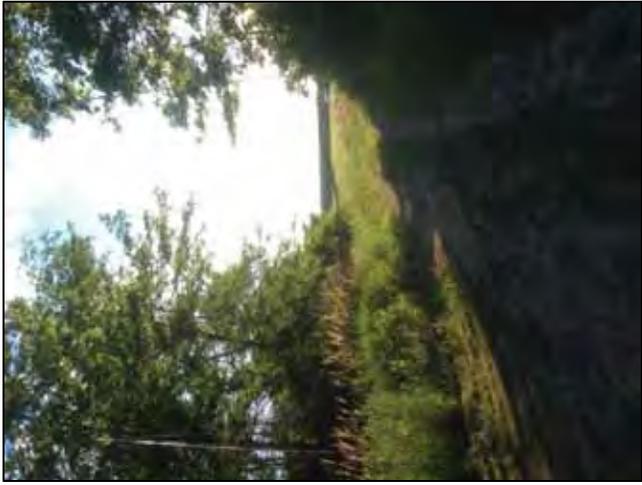
Site EC29 Net C



Site EC29 Net D



Site EC29 Net E



Site EC30 Net A



Site EC30 Net B



Site EC30 Net C



Site EC30 Net D



Site EC30 Net E



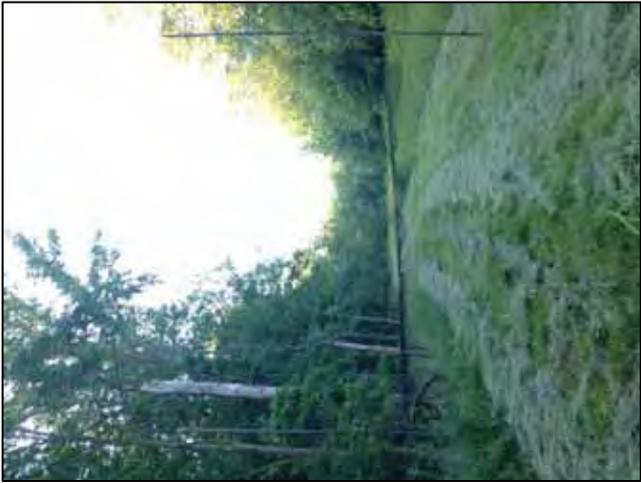
Site EC31 Net A



Site EC31 Net B



Site EC31 Net C



Site EC31 Net D



Site EC31 Net E



Site EC32 Net A



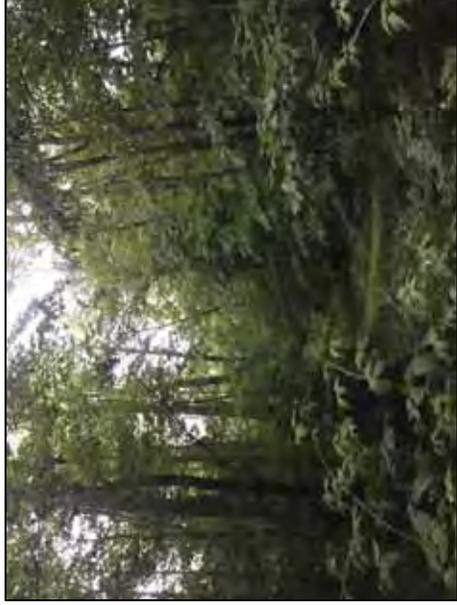
Site EC32 Net B



Site EC32 Net C



Site EC32 Net D



Site EC32 Net E



Site EC33 Net A



Site EC33 Net B



Site EC33 Net C



Site EC33 Net D



Site EC33 Net E



Site EC34 Net A



Site EC34 Net B



Site EC34 Net C



Site EC34 Net D



Site EC34 Net E



Site EC35 Net A



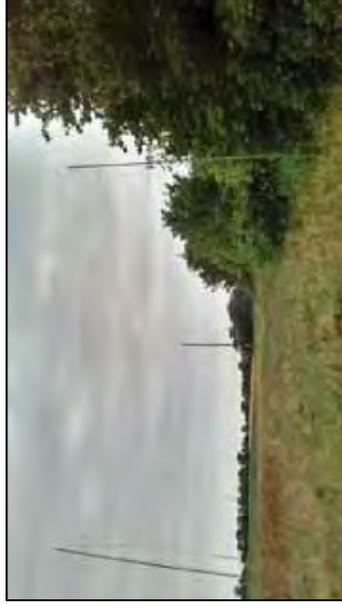
Site EC35 Net B



Site EC35 Net C



Site EC35 Net D



Site EC35 Net E



Site EC36 Net A



Site EC36 Net B



Site EC36 Net C



Site EC36 Net D



Site EC36 Net E



Site EC37 Net C



Site EC37 Net B



Site EC37 Net E



Site EC37 Net A



Site EC37 Net D

APPENDIX C

Bat Capture Photographs



Big Brown Bat (*Eptesicus fuscus*)



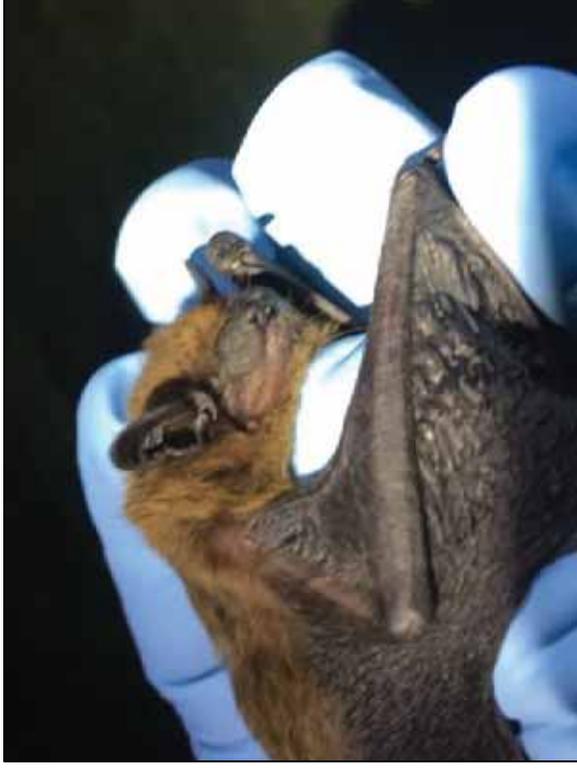
Eastern Red Bat (*Lasiurus borealis*)



Hoary Bat (*Lasiurus cinereus*)



Silver-haired Bat (*Lasionycteris noctivagans*)



Evening Bat (*Nycticeius humeralis*)



Indiana Bat (*Myotis sodalis*)

Exhibit Y

Bat Mist-Netting Reports

4. Summer Indiana Bat Studies for the Emerson Creek Wind Resource Area Seneca and Huron Counties, Ohio dated December 3, 2012

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Attorneys for Firelands Wind, LLC

**Summer Indiana Bat Studies for the
Emerson Creek Wind Resource Area
Seneca and Huron Counties, Ohio**

**Final Report
July 2 – 29, 2012**



Prepared for:

Apex Wind Energy, Inc.

Queen Charlotte Building
212 East High Street
Charlottesville, Virginia 22902

Prepared by:

Timothy Sichmeller, Kevin Murray, Michelle Ritzert and Kimberly Bay

Western EcoSystems Technology, Inc.
408 West Sixth Street
Bloomington, Indiana 47404

December 3, 2012



NATURAL RESOURCES ♦ SCIENTIFIC SOLUTIONS

EXECUTIVE SUMMARY

Apex Wind Energy (Apex) is considering development of a wind energy facility in Seneca and Huron Counties, Ohio, referred to as the Emerson Creek Wind Resource Area (ECWRA). Apex contracted Western EcoSystems Technology, Inc (WEST) to develop and implement a presence/absence survey protocol for the federally endangered Indiana bat. A standard summer mist-net survey was conducted to determine if this species is present within the project area. The principle objectives the summer bat surveys were to: 1) determine the presence/absence of the endangered Indiana bat, 2) describe roosting and foraging habitat of the Indiana bat (if present), and 3) document the occurrence of other bat species.

Mist-net surveys were conducted at 50 net sites between July 2 and July 29, 2012. Bats were captured at all 50 sites, resulting in a total of 1,121 bats. The number of individuals captured at each location, excluding recaptures, varied from one (EC-51) to 89 (EC-20) bats, with a mean of 22.4 bats per site. A total of seven species of bats were captured. Big brown bats were the most common species (622 individuals; 55.5% of total captures), followed by eastern red bats (17.7%), northern long-eared bats (15.2%), little brown bats (7.8%), hoary bats (3.7%), tri-colored bats (0.2%), and evening bats (0.1%). A maternity colony of little brown bats was located in an old barn near mist-net site EC-38. Little brown bats are a species of concern in Ohio. No Indiana bats were captured within the ECWRA. The results indicate that the Indiana bat is not present within the project area during the summer.

STUDY PARTICIPANTS

Western EcoSystems Technology

Michelle Ritzert	Project Manager
Rhett Good	Senior Manager
Kevin Murray	Bat Biologist
Timothy Sichmeller	Bat Biologist, Field Crew Supervisor
Kimberly Bay	Data Analyst and Report Manager
Michelle Sonnenberg	Statistician
J.R. Boehrs	GIS Technician
Jon Cicarelli	GIS Technician
Andrea Palochak	Technical Editor
Hannah Hayes	Field Technician

REPORT REFERENCE

Sichmeller, T., K. Murray, M. Ritzert, and K. Bay. 2012. Summer Indiana Bat Studies for the Emerson Creek Wind Resource Area, Seneca and Huron Counties, Ohio. Final Report: July 2 – 29, 2012. Prepared for Apex Wind Energy, Inc. Charlottesville, Virginia. Prepared by Western EcoSystems Technology, Inc. (WEST), Bloomington, Indiana.

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Appendix F. Mist-Net Survey Capture, Roost, and Weather Data Sheets (separate PDF)

BACKGROUND

Apex Wind Energy (Apex) is considering development of the Emerson Creek Wind Resource Area (ECWRA) in Seneca and Huron Counties, Ohio (Figure 1). Apex contracted Western EcoSystems Technology, Inc (WEST) to conduct a presence/absence mist-net survey for the endangered Indiana bat (*Myotis sodalis*) at the ECWRA. A standard summer mist-net survey was conducted from July 2 – 29, 2012. The principle objectives of the summer Indiana bat surveys for the proposed ECWRA were to: 1) determine the presence/absence of the endangered Indiana bat, 2) describe roosting and foraging habitat of the Indiana bat (if present), and 3) document the occurrence of other bat species. The following report provides the methods and results of mist-net surveys and telemetry conducted at the ECWRA in July, 2012.

STUDY AREA

The proposed ECWRA is located in Seneca and Huron Counties in north-central Ohio and covers three Level III Ecoregions: the Eastern Corn Belt Plains Ecoregion, Huron/Erie Lake Plains and Erie/Ontario Drift and Lake Plain (USEPA 2007). The Eastern Corn Belt Plains Ecoregion is a rolling plain with local end moraines that originally had more natural tree cover than the Central Corn Belt Plains, and has loamier and better drained soils than the Huron/Erie Lake Plains. The Huron/Erie Lake Plains Level III Ecoregion encompasses much of northwestern Ohio and is a broad, fertile, and nearly flat plain punctuated by relict sand dunes, beach ridges, and end moraines (USEPA 2007). A small portion of the ECWRA also occurs within the Erie/Ontario Drift and Lake Plain, which is characterized by a flat coastal strip of lacustrine deposits punctuated by beach ridges and swales. Elevations in the ECWRA range from 230 – 280 meters (m; 755 – 919 feet [ft]) above mean sea level.

The ECWRA encompasses approximately 59,305 acres (92.6 square miles [mi²]; Figure 2). According to the National Land Cover Dataset (USGS NLCD 2001; Figure 2), the dominant cover type within the ECWRA is cultivated cropland (corn [*Zea mays*] and soybean [*Glycine max*]), composing 82.8% (49,088 acres [76.7 mi²]) of the total land area. The second most common cover type is deciduous forest, (10.2%; 6,025 acres [9.4 mi²]), followed by developed areas (5.2%; 3,073 acres [4.8 mi²]). Developed areas are generally confined to residences and farms scattered throughout the ECWRA. Pasture/hay, barren areas, open water, grasslands, mixed forest, emergent wetlands, evergreen forests, and woody wetlands make up 1% or less of the total area individually.

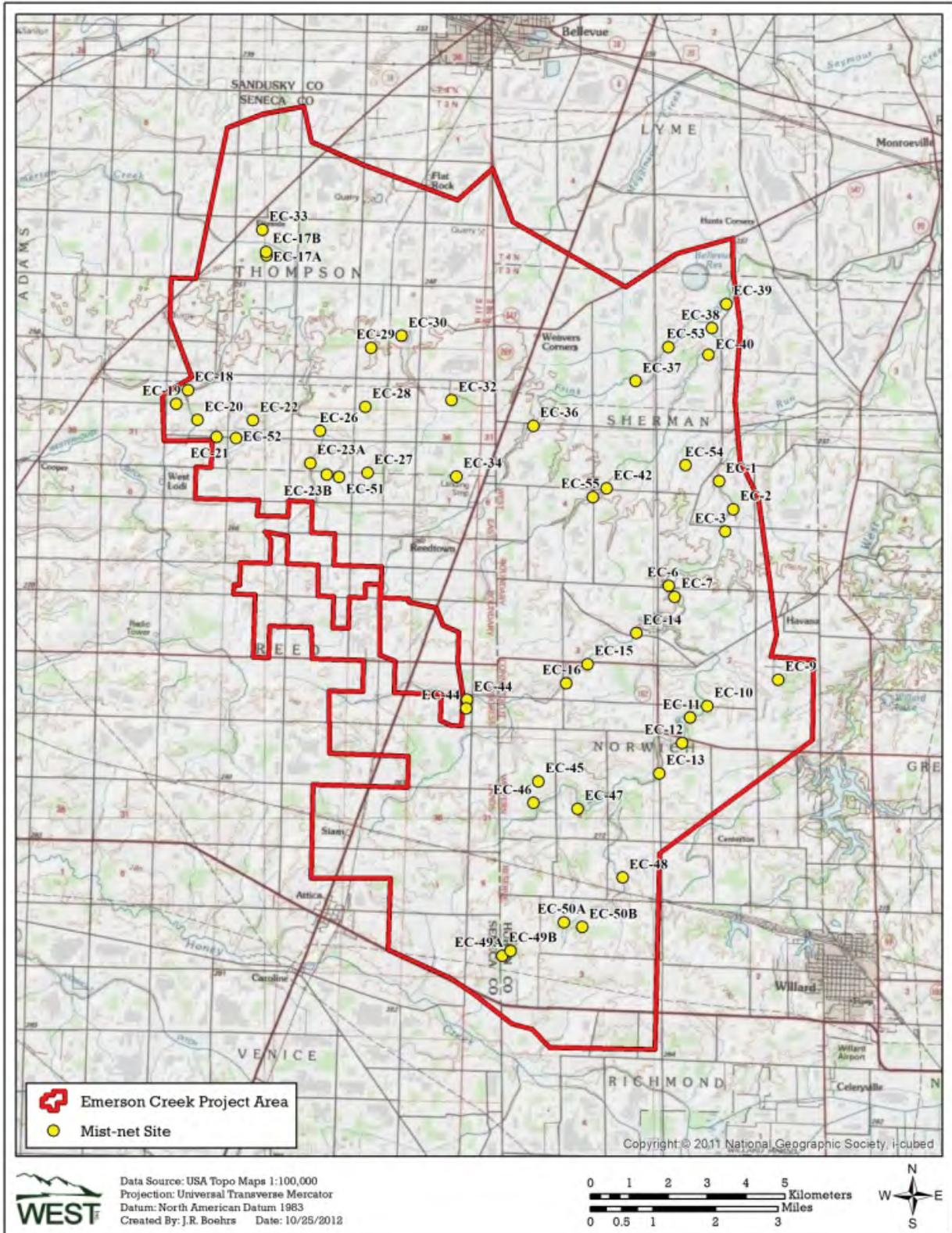


Figure 1. Topographic map of 50 mist-net sites at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.

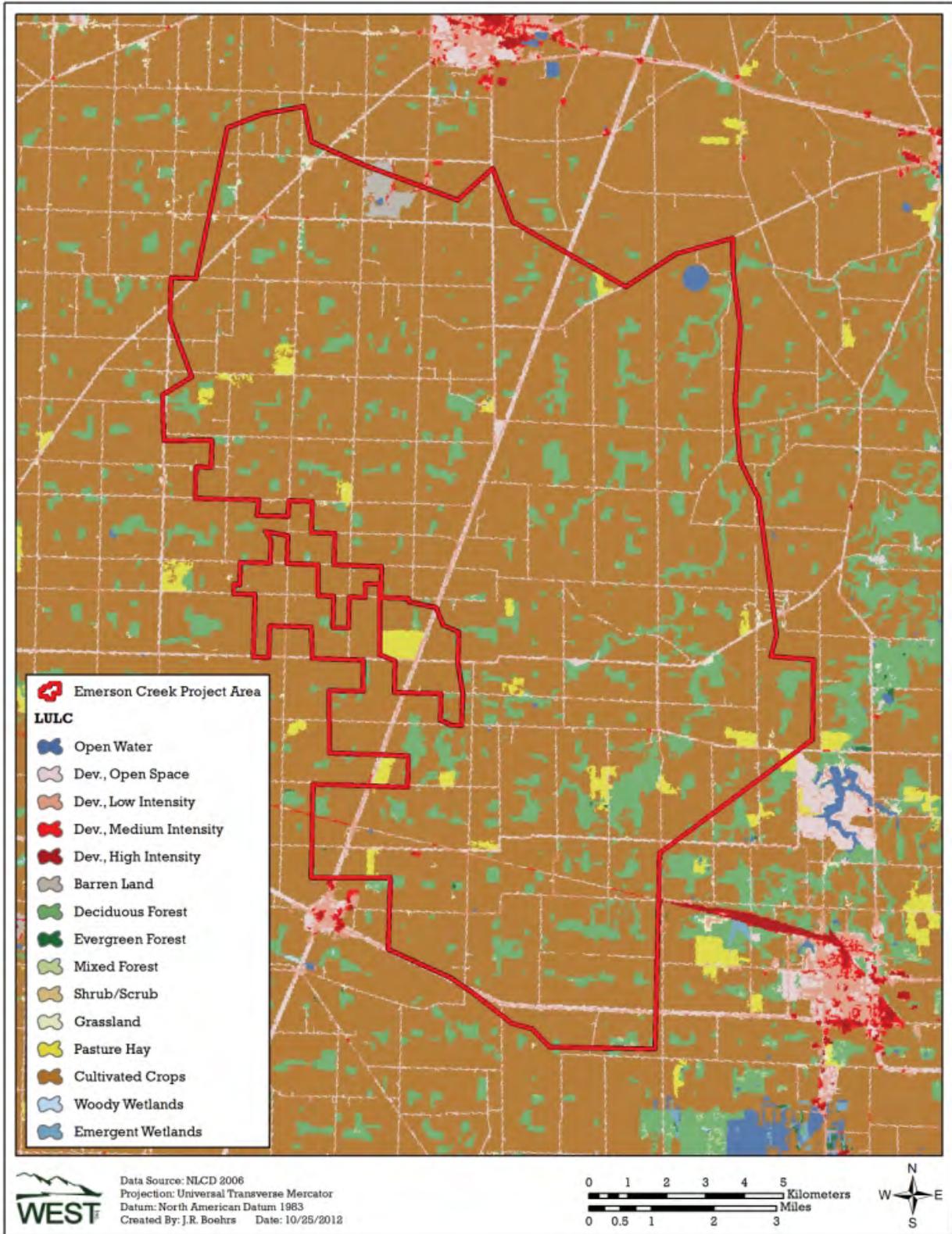


Figure 2. The land cover types and coverage within Emerson Creek Wind Resource Area (USGS NLCD 2006).

OVERVIEW OF BAT DIVERSITY

The state of Ohio is within the range of the federally endangered Indiana bat. A total of seven known hibernacula (two active since 1995) in the state house an estimated 9,870 Indiana bats or about 2.3% of the 2011 population estimate for the species (USFWS 2012a). All known hibernacula are located in the southern or western part of the state. In spring, female Indiana bats migrate from winter hibernacula to summer habitat, where they form maternity colonies. Indiana bats typically form maternity colonies under the exfoliating bark of large-diameter snags and trees associated with bottomland, riparian, and upland forest tracts (USFWS 2007). Eleven maternity colonies have been documented in 11 Ohio counties. The proposed ECWRA is located in Seneca and Huron Counties, Ohio. There are no previous Indiana bat summer capture records in Huron County. However, there are capture records in Seneca County within 5 mi. of the ECWRA (ODNR letter dated June 19, 2012). There are summer capture records in two adjacent counties, Ashland and Richland Counties, Ohio. Lewisburg Mine, a Priority 2 Indiana bat hibernaculum, is located approximately 193 kilometers (km; 120 miles) to the southwest of the ECWRA in northeast Preble County, Ohio. The maximum population estimate for Lewisburg Mine since 2000 is 9,638 Indiana bats (USFWS 2007).

In addition to the Indiana bat, 10 other species of bats are found in Ohio. Those species include: the big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), northern long-eared bat (*M. septentrionalis*), little brown bat (*M. lucifugus*), evening bat (*Nycticeius humeralis*), tri-colored bat (*Perimyotis subflavus*), Rafinesque's big-eared bat (*Corynorhinus rafinesquii*), and eastern small-footed bat (*M. leibii*). The Indiana bat is both federally and state endangered (ODNR 2010, 2012; USFWS 2007), while the Rafinesque's big-eared bat, eastern small-footed bat, northern long-eared bat, tri-colored bat, little brown bat, and big brown bat are all species of concern in Ohio (ODNR 2010, 2012). With the spread of white-nose syndrome (WNS) throughout the eastern US, several once common and abundant bat species, such as the little brown bat and northern long-eared bat, are experiencing population declines (Frick et al. 2010). Due to concerns over the potential impact of WNS, the northern long-eared bat, tri-colored bat, little brown bat, and big brown were listed as species of concern in Ohio in 2010 (ODNR 2010, 2012).

METHODS

Mist-Net Surveys

Summer mist-net surveys at ECWRA were conducted to: 1) determine the presence/absence of the endangered Indiana bat, 2) describe roosting and foraging habitat of the Indiana bat (if present), and 3) document the occurrence of other bat species. All mist-netting efforts focused on the federally endangered Indiana bat and met Ohio Department of Natural Resources (ODNR) bat survey protocols (ODNR 2009), which currently exceed the requirements of the US Fish and Wildlife Service (USFWS) mist-netting guidelines, outlined in the *Indiana Bat (Myotis*

sodalis) *Draft Recovery Plan: First Revision* (April 2007). All mist-net surveys were performed by an individual permitted or approved by USFWS personnel to capture and handle Indiana bats.

Mist-netting was conducted from July 2 to July 29, 2012, consistent with ODNR and USFWS guidelines for Indiana bat mist-net surveys (ODNR 2009, USFWS 2007). Female Indiana bats typically form maternity colonies under the exfoliating bark of large-diameter snags and live trees. Roost trees are usually associated with canopy gaps or forested edges which allows roosts to receive direct sunlight for a significant portion of the day. Habitats most commonly associated with the roost trees of Indiana bats include woody wetlands, bottomlands, floodplains, riparian, and upland deciduous forest tracts (USFWS 2007). Whenever possible, mist-net effort was focused on the largest mature forest blocks within these habitat types or within potential travel corridors.

Specific mist-net sites were determined by on-site scouting by bat biologists with Indiana bat research experience (T. Sichmeller and K. Murray). Mist-net sites were selected based on the following criteria: 1) presence of relatively large, contiguous forested areas; 2) presence of permanent water resources; 3) presence of suitable Indiana bat habitat; 4) presence of flight corridors (such as streams, trails, or open woods); and 5) lands leased by Apex. The USFWS guidelines for Indiana bat surveys recommend a minimum of one mist-net site per 123 acres (0.2 mi²) of suitable forest habitat (USFWS 2007). Deciduous/mixed forest woodlots and woody wetlands within the project area represent potential habitat for the Indiana bat and cover approximately 6,045 acres (9.4 mi²; 10.2%) of the ECWRA (Figure 2). Based on the amount of available habitat, the ODNR and USFWS survey guidelines call for 50 mist-net sites at the proposed ECWRA. All mist-net surveys were performed by individuals permitted and approved by USFWS to capture and handle Indiana bats (T. Sichmeller, K. Murray, A. Zurcher, J. Damm, L. Bishop-Boros, R. Allen, R. Slack, R. McClanahan, D. Carson, B. Steffen, S. Williams, and S. Romeling).

Per ODNR guidelines, a minimum of four net sets were used at each mist-net site, with at least one net set being 7.8 m (25.6 ft) tall. Each site was surveyed twice on non-consecutive nights. Mist-netting began at sunset and continued for at least five hours. Nets were checked approximately every 10 minutes. Net locations were established at least 30 m (98.42 ft) apart at each mist-net site. Mist-nets were usually placed perpendicularly across flight corridors, filling the corridor from side to side and extending from ground-level up to overhanging canopy (when present). Standard two-ply, 50 denier, nylon mist-nets with a mesh size of 38 millimeters (mm; 1.30 inches) were used at all mist-net sites. Disturbance in the form of noise and movement was minimized at all net locations. Surveys were not conducted on nights with persistent rain, strong winds, or cold temperatures (below 10°C [50°F]) (USFWS 2007).

For each mist-net night the date, start and end time, site description, site coordinates, mist-net specifics, and weather data (e.g. temperature, cloud cover, moon phase, precipitation, and wind speed) were recorded. All captured bats were identified to species. In addition, sex, age, reproductive condition, body mass (grams [g]), forearm length (mm), and capture status

(recapture/new) were recorded for each bat. When possible, bats were photo-documented with voucher photographs taken of species-specific identifiable features (e.g. head, pelage, calcar, foot, toe hairs). To assess damage from WNS, a Reichard Index score (0-3) was recorded for all captured bats (Reichard 2009). To prevent cross-contamination of captured bats with *Geomyces destructans*, the fungus that causes WNS (Lorch et al. 2011, Warnecke et al. 2012), the USFWS decontamination protocol was followed for all mist-netting efforts (USFWS 2010). Captured bats were measured and processed immediately and usually released within 15 minutes.

Radio-Telemetry Survey

The objective of the telemetry study was to determine if endangered Indiana bats, or Rafinesque's big-eared bats or eastern small-footed *Myotis* (both state species of concern) were utilizing areas in or near the study area as roost sites, maternity colonies, or foraging areas. Captured sensitive bat species were outfitted with a 0.22 or 0.27 gram (g) radio-transmitter (model no. LB-2X; Holohil Systems Ltd., Ontario, Canada) and tracked for up to five days. Transmitter signals were followed during daylight hours to find roost and potential maternity sites. For each roost tree or maternity colony, photographs and global positioning system (GPS) coordinates, roost type (tree, building, etc.), tree species, tree type (live, snag), tree diameter at breast height (DBH), approximate roost height (m), and roost location (cavity, crevice, bark, etc.) were recorded.

RESULTS

Mist-Net Surveys

Mist-net surveys were conducted at a total of 203 nets at 50 sites (406 net nights) between July 2 and July 29, 2012. One hundred and twenty-three of the of the 203 nets were set in forest habitat over a road, trail, or all-terrain vehicle (ATV) track, while 59 nets were set over water sources, such as creeks or irrigation ditches. Eleven nets were placed in the forest interior and the remaining 10 nets were set on the edge of forest habitat (Table 1; Figure 1; Appendices A and B). Bats were captured at all 50 sites, resulting in a total of 1,121 bats (Table 2; Appendices B, C, D, E, and F). The number of individuals captured at each location, excluding recaptures, varied from one (EC-51) to 89 bats (EC-20), with a mean of 22.4 bats per site. There were a total of 11 recaptures (Appendix F). Seven species of bats were captured (Table 2). Big brown bats were the most common species captured (622 individuals; 55.5% of total captures), followed by eastern red bats (17.7%), northern long-eared bats (15.2%), little brown bats (7.8%), hoary bats (3.7%), tri-colored bats (0.2%), and evening bats (0.1%). The details of each bat captured are summarized in Appendix E and in project data sheets (Appendix F).

Table 1. Location and site description of 50 mist-net sites at the Emerson Creek Wind Resource Area; July 2 – 29, 2012.

Site ID	Net	UTM [†]		Site Description
EC-1	A	351718	4558928	Net over trail through woodlot
	B	351686	4558881	Net over creek through woodlot
	C	351677	4558826	Net over creek through woodlot
	D	351684	4558759	Net over creek through woodlot
EC-2	A	352067	4558122	Net over trail through woodlot
	B	352050	4558163	Net over creek through woodlot
	C	352034	4558164	Net over trail through woodlot
	D	352044	4558107	Net over creek through woodlot
EC-3	A	351817	4557656	Net over trail through woodlot
	B	351840	4557589	Net over trail through woodlot
	C	351838	4557624	Net over trail through woodlot
	D	351839	4557554	Net over trail through woodlot
EC-6	A	350389	4556169	Net over creek through woodlot
	B	350394	4556187	Net over creek through woodlot
	C	350345	4556210	Net over creek through woodlot
	D	350370	4556401	Net over creek through woodlot
EC-7	A	350533	4555928	Net over creek through woodlot
	B	350540	4555907	Net over creek through woodlot
	C	350561	4555897	Net over creek through woodlot
	D	350588	4555850	Net over creek through woodlot
EC-9	A	353177	4553808	Net over trail through woodlot
	B	353209	4553767	Net over trail through woodlot
	C	353212	4553789	Net over trail through woodlot
	D	353251	4553779	Net over trail through woodlot
EC-10	A	351383	4553091	Net over creek through woodlot
	B	351383	4553088	Net over creek through woodlot
	C	351394	4553073	Net over creek through woodlot
	D	351350	4553188	Net over creek through woodlot
EC-11	A	350957	4552819	Net over creek through woodlot
	B	350936	4552789	Net over creek through woodlot
	C	350935	4552780	Net over creek through woodlot
	D	350947	4552752	Net over creek through woodlot
EC-12	A	350740	4552208	Net over trail through woodlot
	B	350735	4552140	Net over trail through woodlot
	C	350812	4552168	Net over creek through woodlot
	D	350810	4552220	Net over creek through woodlot
EC-13	A	350129	4551341	Net over trail through woodlot
	B	350146	4551352	Net over creek through woodlot
	C	350165	4551355	Net over trail through woodlot
	D	350075	4551359	Net over trail through woodlot
EC-14	A	349532	4554942	Net over trail through woodlot
	B	349552	4554969	Net over trail through woodlot
	C	349545	4554946	Net over dry creek bed
	D	349564	4554915	Net over dry creek bed
EC-15	A	348321	4554214	Net over small creek
	B	348303	4554168	Net over small creek
	C	348310	4554134	Net over small creek
	D	348296	4554122	Net over small creek
EC-16	A	347788	4553679	Net over small creek
	B	347749	4553679	Net over small creek
	C	347702	4553692	Net over small creek
	D	347721	4553656	Net place in interior of forest

Table 1. Location and site description of 50 mist-net sites at the Emerson Creek Wind Resource Area; July 2 – 29, 2012.

Site ID	Net	UTM†		Site Description
EC-17A	A	340030	4564650	Net over trail through woodlot
	B	340040	4564699	Net over trail through woodlot
	C	340064	4564666	Net over trail through woodlot
	D	340092	4564673	Net over trail through woodlot
EC-17B	A	340088	4564846	Net over trail through woodlot
	B	340033	4564794	Net over trail through woodlot
	C	340066	4564748	Net over trail through woodlot
	D	340090	4564758	Net over trail through woodlot
EC-18	A	338016	4561248	Net over trail through woodlot
	B	338016	4561229	Net over trail through woodlot
	C	338023	4561220	Net over small creek
	D	338022	4561185	Net over small creek
EC-19	A	337716	4560892	Net over trail through woodlot
	B	337713	4560874	Net over trail through woodlot
	C	337747	4560894	Net over trail through woodlot
	D	337770	4560925	Net over trail through woodlot
EC-20	A	338259	4560480	Net over drainage ditch
	B	338270	4560460	Net over drainage ditch
	C	338270	4560447	Net over drainage ditch
	D	338281	4560427	Net over drainage ditch
EC-21	A	338726	4560033	Net over trail through woodlot
	B	338751	4560019	Net over trail through woodlot
	C	338781	4559976	Net over trail through woodlot
	D	338737	4559990	Net over trail through woodlot
EC-22	A	339726	4560466	Net over trail through woodlot
	B	339690	4560452	Net placed on edge of woodlot
	C	339824	4560442	Net over trail through woodlot
	D	339819	4560485	Net over trail through woodlot
EC-23A	A	341166	4559277	Net placed over small stream
	B	341169	4559347	Net placed over small stream
	C	341189	4559416	Net placed over small stream
	D	341219	4559450	Net placed over small stream
EC-23B	A	341631	4559069	Net over trail through woodlot
	B	341591	4559048	Net over trail through woodlot
	C	341560	4559065	Net over trail through woodlot
	D	341502	4559060	Net over trail through woodlot
EC-26	A	341485	4560097	Net placed over small stream
	B	341415	4560176	Net placed over small stream
	C	341423	4560251	Net placed over small stream
	D	341411	4560342	Net placed over small stream
EC-27	A	342609	4559049	Net over a trail through woodlot
	B	342637	4559098	Net over a trail through woodlot
	C	342624	4559145	Net over a trail through woodlot
	D	342546	4559111	Net over a trail through woodlot
EC-28	A	342549	4560731	Net placed on edge of woodlot
	B	342581	4560798	Net placed on edge of woodlot
	C	342586	4560872	Net placed on edge of woodlot
	D	342666	4560920	Net over small trail into woodlot
EC-29	A	342721	4562351	Net over trail through woodlot
	B	342728	4562319	Net over trail through woodlot
	C	342693	4562299	Net over trail through woodlot
	D	342729	4562283	Net over dry creek bed

Table 1. Location and site description of 50 mist-net sites at the Emerson Creek Wind Resource Area; July 2 – 29, 2012.

Site ID	Net	UTM [†]		Site Description
EC-30	A	343535	4562635	Net over trail through woodlot
	B	343517	4562630	Net over trail through woodlot
	C	343511	4562646	Net over trail through woodlot
	D	343520	4562669	Net over trail through woodlot
EC-32	A	344810	4560966	Net over trail through woodlot
	B	344799	4560973	Net over trail through woodlot
	C	344779	4561001	Net over trail through woodlot
	D	344777	4561008	Net over trail through woodlot
EC-33	A	339892	4565365	Net placed on edge of woodlot
	B	339932	4565361	Net placed on edge of woodlot
	C	339974	4565372	Net placed between two woodlots
	D	340014	4565375	Net placed between barn and tree
EC-34	A	344965	4558972	Net over trail through woodlot
	B	344926	4559002	Net over trail through woodlot
	C	344883	4559004	Net over trail through woodlot
	D	344883	4558973	Net over trail through woodlot
EC-36	A	346914	4560325	Net on edge of woodlot
	B	346903	4560309	Net on edge of woodlot
	C	346872	4560296	Net placed over small stream
	D	346854	4560280	Net placed over small stream
EC-37	A	349535	4561424	Net over an entrance to creek
	B	349535	4561462	Net over small creek
	C	349557	4561421	Net over small creek
	D	349593	4561399	Net over small creek
EC-38	A	351541	4562837	Net over a drivable road past a barn
	B	351502	4562825	Net over small creek
	C	351542	4562811	Net over small creek
	D	351546	4562761	Net over small creek
	E	351453	4562832	Net over small creek
EC-39	A	351894	4563486	Net over small creek
	B	351876	4563451	Net over two-track road
	C	351946	4563469	Net over two-track road
	D	351830	4563370	Net over small creek
EC-40	A	351452	4562152	Net over small creek
	B	351415	4562140	Net over road
	C	351440	4562113	Net over small creek
	D	351384	4562116	Net over small creek
EC-42	A	348799	4558674	Net placed on edge of woodlot
	B	348789	4558694	Net over small creek
	C	348805	4558711	Net over small creek
	D	348771	4558698	Net placed on edge of woodlot
EC-44	A	345157	4553277	Net over grass pathway through two woodlots
	B	345197	4553250	Net over grass pathway through two woodlots
	C	345280	4553298	Net over grass pathway through two woodlots
	D	345332	4553316	Net over grass pathway through two woodlots
EC-45	A	347087	4551228	Net over grass pathway through two woodlots
	B	347039	4551148	Net over grass pathway through two woodlots
	C	347026	4551106	Net over grass pathway through two woodlots
	D	347021	4551012	Net over grass pathway through two woodlots
EC-46	A	346911	4550620	Net over trail through woodlot
	B	346911	4550594	Net over trail through woodlot

Table 1. Location and site description of 50 mist-net sites at the Emerson Creek Wind Resource Area; July 2 – 29, 2012.

Site ID	Net	UTM [†]	Site Description	
	C	346888	4550566	Net over trail through woodlot
	D	346937	4550554	Net over trail through woodlot
EC-47	A	348077	4550473	Net placed on edge of woodlot
	B	348048	4550442	Net placed between woodlot and small creek
	C	348103	4550322	Net over small creek
	D	348132	4550305	Net placed on edge of woodlot
EC-48	A	349217	4548627	Net placed over trail leading to small creek
	B	349200	4548672	Net over small creek
	C	349191	4548695	Net over small creek
	D	349157	4548716	Net over small creek
EC-49A	A	346123	4546648	Net over trail through woodlot
	B	346107	4546657	Net over trail through woodlot
	C	346103	4546719	Net over trail through woodlot
	D	346122	4546696	Net placed in interior of woodlot
	E	346066	4546665	Net over trail through woodlot
EC-49B	A	346269	4546781	Net over trail through woodlot
	B	346320	4546782	Net placed in interior of woodlot
	C	346361	4546751	Net placed in interior of woodlot
	D	346391	4546765	Net placed in interior of woodlot
	E	346376	4546844	Net over trail through woodlot
EC-50A	A	347700	4547546	Net over trail through woodlot
	B	347697	4547518	Net over trail through woodlot
	C	347713	4547487	Net over trail through woodlot
	D	347761	4547461	Net over trail through woodlot
EC-50B	A	348169	4547425	Net over trail through woodlot
	B	348168	4547394	Net over trail through woodlot
	C	348154	4547348	Net over trail through woodlot
	D	348167	4547333	Net over trail through woodlot
EC-51	A	341951	4558932	Net over a trail through woodlot
	B	341907	4558994	Net over a trail through woodlot
	C	341921	4559063	Net over a trail through woodlot
	D	341833	4559111	Net over a trail through woodlot
EC-52	A	339284	4559973	Net over trail through woodlot
	B	339255	4559990	Net over trail through woodlot
	C	339212	4559945	Net over trail through woodlot
	D	339228	4559909	Net over trail through woodlot
EC-53	A	350403	4562320	Net over creek through woodlot
	B	350384	4562339	Net over creek through woodlot
	C	350353	4562313	Net over creek through woodlot
	D	350338	4562293	Net over creek through woodlot
EC-54	A	350825	4559174	Net over a trail through woodlot
	B	350819	4559293	Net over a trail through woodlot
	C	350770	4559249	Net over a trail through woodlot
	D	350706	4559239	Net over a trail through woodlot
EC-55	A	348452	4558491	Net over creek through woodlot
	B	348433	4558474	Net over creek through woodlot
	C	348409	4558418	Net over creek through woodlot
	D	348401	4558394	Net over creek through woodlot

† = NAD 1983, Zone 17T

Table 2. Summary of bat captures at 50 mist-net sites at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio (July 2 – 29, 2012).

Site Number	Big Brown Bat	Eastern Red Bat	Evening Bat	Hoary Bat	Little Brown Bat	Northern Long-Eared Bat	Tri-Colored Bat	Grand Total
EC-1	21	14	0	4	4	4	0	47
EC-2	10	1	0	2	2	6	0	21
EC-3	7	3	0	3	3	1	0	17
EC-6	14	11	0	6	7	4	0	42
EC-7	6	1	0	1	3	2	1	14
EC-9	39	6	0	0	1	16	0	62
EC-10	13	3	0	1	1	1	0	19
EC-11	3	6	0	1	0	2	0	12
EC-12	25	3	0	0	1	3	1	33
EC-13	20	8	0	2	2	1	0	33
EC-14	7	7	0	1	5	1	0	21
EC-15	8	3	0	1	2	1	0	15
EC-16	15	1	0	2	1	0	0	19
EC-17A	20	1	0	0	1	3	0	25
EC-17B	10	0	0	0	0	4	0	14
EC-18	35	14	0	1	0	11	0	61
EC-19	2	0	0	0	0	3	0	5
EC-20	75	6	0	1	0	7	0	89
EC-21	1	0	0	0	0	9	0	10
EC-22	5	6	0	0	2	3	0	16
EC-23A	10	5	0	0	1	1	0	17
EC-23B	2	0	0	0	0	1	0	3
EC-26	8	4	0	0	1	3	0	16
EC-27	12	6	0	1	0	4	0	23
EC-28	2	10	0	0	0	2	0	14
EC-29	1	2	0	0	0	5	0	8
EC-30	4	2	0	0	0	2	0	8
EC-32	7	0	0	0	0	2	0	9
EC-33	7	1	0	0	0	1	0	9
EC-34	2	6	0	0	0	5	0	13
EC-36	0	0	0	1	0	1	0	2
EC-37	26	9	0	1	0	2	0	38
EC-38	5	3	0	1	45	2	0	56
EC-39	22	10	0	2	4	1	0	39
EC-40	23	5	0	2	0	1	0	31
EC-42	1	3	0	2	1	3	0	10
EC-44	2	1	0	1	0	1	0	5
EC-45	29	7	0	0	0	0	0	36
EC-46	3	2	0	0	0	7	0	12
EC-47	37	8	0	1	0	12	0	58
EC-48	20	4	0	0	0	6	0	30
EC-49A	5	1	0	1	0	12	0	19
EC-49B	3	2	0	0	0	3	0	8
EC-50A	18	3	0	1	0	1	0	23
EC-50B	18	2	1	0	0	2	0	23
EC-51	1	0	0	0	0	0	0	1
EC-52	0	0	0	0	0	2	0	2
EC-53	10	5	0	1	0	1	0	17
EC-54	0	1	0	0	0	3	0	4
EC-55	8	2	0	0	0	2	0	12

Table 2. Summary of bat captures at 50 mist-net sites at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio (July 2 – 29, 2012).

Site Number	Big Brown Bat	Eastern Red Bat	Evening Bat	Hoary Bat	Little Brown Bat	Northern Long-Eared Bat	Tri-Colored Bat	Grand Total
Grand Total	622	198	1	41	87	170	2	1,121

Radio-Telemetry Survey

On July 7, 2012, 45 little brown bats were captured at site EC-38 (Appendix E). Per ODNR guidelines, a transmitter was attached to a lactating female little brown bat to locate the nearby maternity roost (ODNR 2009). The capture net was set over a gravel road just past a barn. The woodlot around the capture site was a mature (five – 30-centimeter [cm; two – 12-inch] DBH) stand of black walnut (*Juglans nigra*) and black willow (*Salix nigra*). The following day, the transmittered bat was located, along with hundreds of other little brown bats in the barn (EC-R1; Table 3, Figure 3, Appendix D) close to the capture site.

Table 3. Location and general site description of Ohio bat roost at Emerson Creek Wind Resource Area.

ID	Figure	UTM Coordinates [†]	Habitat
EC-R1	3	351635 4562796	Located under peeling wood inside old barn

[†] North American Datum 1983, Zone 17T

DISCUSSION

Mist-nest surveys at 50 sites on the ECWRA resulted in the capture of 1,121 bats of seven species (Table 2). Those species included the big brown bat, eastern red bat, northern long-eared bat, little brown bat, hoary bat, tri-colored bat, and evening bat. Big brown bats (55.5%), eastern red bats (17.7%), and northern long-eared bats (15.2%) were the three most commonly captured bats during the survey. Two species of the genus *Myotis* were encountered (northern long-eared bat and little brown bat; about 23% of all captures). A maternity colony of little brown bats, a species of concern in Ohio (ODNR 2010, 2012), was located in a barn near mist-net site EC-38.

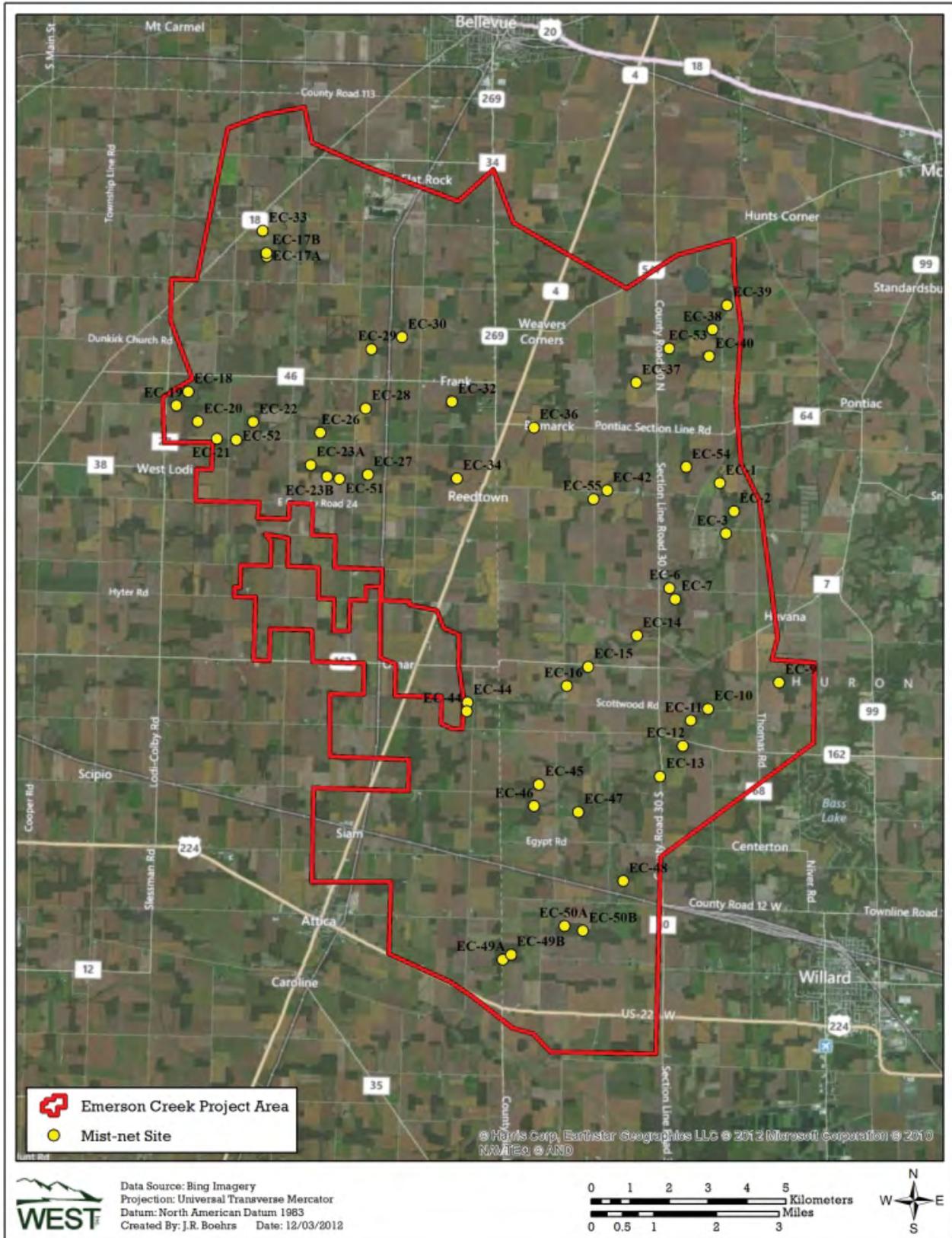
There are no previous Indiana bat summer capture records in Huron County. However, there are capture records in Seneca County within 5 mi. of the ECWRA (ODNR letter dated June 19, 2012). There are also summer capture records in two adjacent counties, Ashland and Richland Counties, Ohio. However, no Indiana bats were captured at any of the 50 sites within the ECWRA (Table 2; Appendices A-F). The results of the 2012 survey indicate that this species is not present within the ECWRA.

REFERENCES

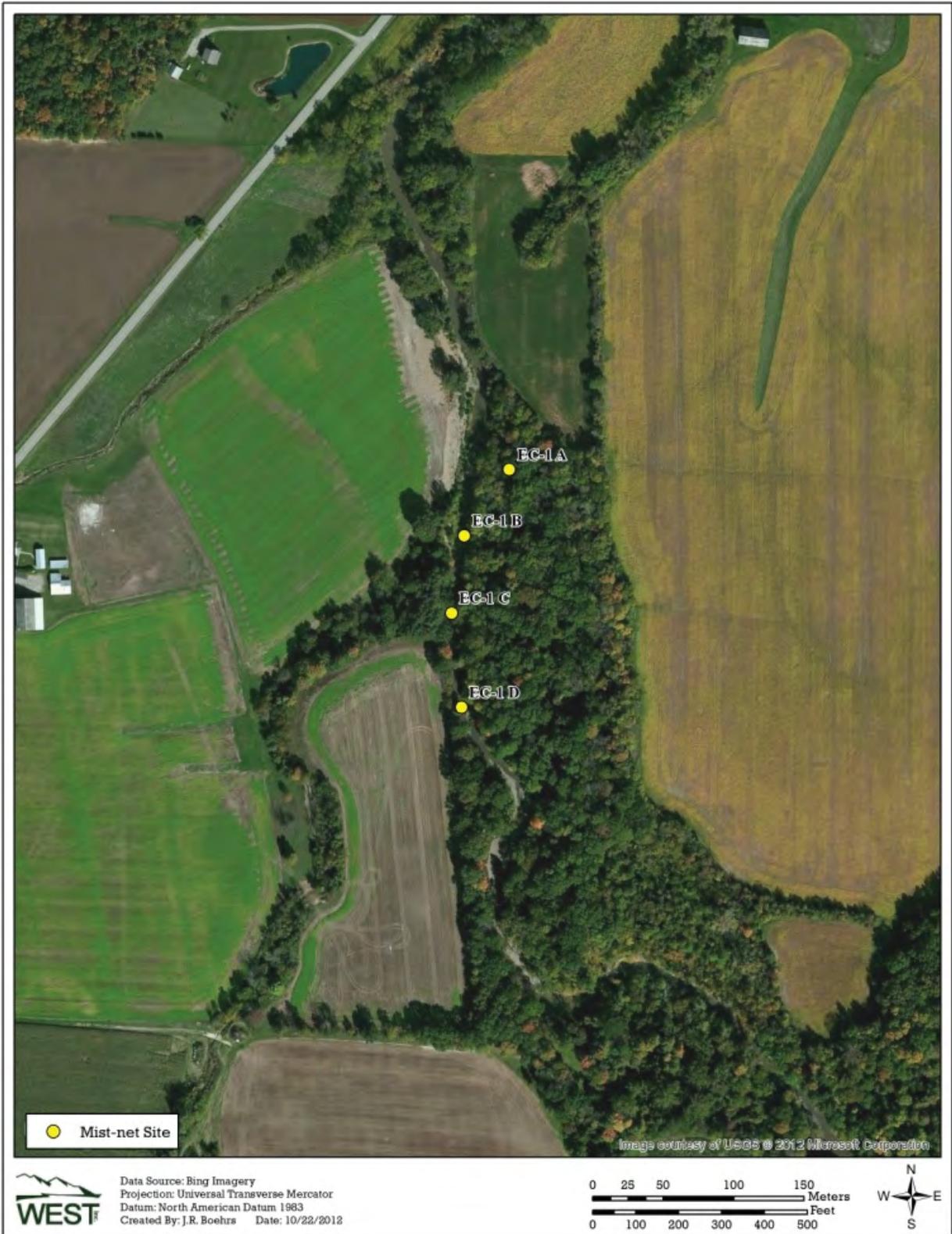
- Bing. 2012. Bing Aerial Maps. Microsoft Corporation.
- Frick, W.F., J.F. Pollock, A.C. Hicks, K.E. Langwig, D.S. Reynolds, G.G. Turner, C.M. Butchkoski, and T.H. Kunz. 2010. An Emerging Disease Causes Regional Population Collapse of a Common North American Bat Species. *Science* 329: 679-682.
- Lorch, J.M., C.U. Meteyer, M.J. Behr, J.G. Boyles, P.M. Cryan, A.C. Hicks, A.E. Ballmann, J.T.H. Coleman, D.N. Redell, D.M. Reeder, and D.S. Blehert. 2011. Experimental Infection of Bats with *Geomyces destructans* Causes White-Nose Syndrome. *Nature* 480: 376-378; doi: 310.1038/nature10590.
- North American Datum (NAD). 1983. NAD83 Geodetic Datum.
- Ohio Department of Natural Resources (ODNR). 2009. On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio. An Addendum to the Ohio Department of Natural Resource's Voluntary Cooperative Agreement. Exhibit A. ODNR Division of Wildlife. March 4, 2009. Available at: <http://ohiodnr.com/LinkClick.aspx?fileticket=loJTSEwL2uE%3d&tabid=21467>
- Ohio Department of Natural Resources (ODNR). 2010. Wildlife That Are Considered to Be Endangered, Threatened, Species of Concern, Special Interest, Extirpated, or Extinct in Ohio. Updated October 2010.
- Ohio Department of Natural Resources (ODNR). 2012. State Listed Species: Wildlife That Are Considered Endangered, Threatened, Species of Concern, Special Interest, Extirpated, or Extinct in Ohio. List of Ohio species that are endangered available online at: www.dnr.state.oh.us/wildlife/Home/resources/mgtplans/endangered/tabid/6005/Default.aspx; threatened at: <http://www.dnr.state.oh.us/Home/ExperienceWildlifeSubHomePage/Endangeredthreatenedspeciesplaceholder/resourcesmgtplans/threatened/tabid/6006/Default.aspx>; species of concern at: <http://www.dnr.state.oh.us/Home/ExperienceWildlifeSubHomePage/Endangeredthreatenedspeciesplaceholder/resourcesmgtplans/speciesofconcern/tabid/6007/Default.aspx>
- Reichard, J.E. 2009. Wing-Damage Index Used for Characterizing Wing Condition of Bats Affected by White-Nose Syndrome. Center for Ecology and Conservation, Boston University, Boston, Massachusetts.
- US Environmental Protection Agency (USEPA). 2007. Ohio Level III and IV Ecoregions. USEPA, Corvallis, Oregon. Available at: http://www.epa.gov/wed/pages/ecoregions/ohin_eco.htm
- US Fish and Wildlife Service (USFWS). 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. US Department of Interior, Fish and Wildlife Service, Region 3. USFWS. Fort Snelling, Minnesota. 260 pp. http://ecos.fws.gov/docs/recovery_plan/070416.pdf
- US Fish and Wildlife Service (USFWS). 2010. White-Nose Syndrome Decontamination Protocols. White nose Syndrome: <http://www.fws.gov/WhiteNoseSyndrome/>; Decontamination protocols available at: http://www.fws.gov/whitenosesyndrome/ppt/NPS_Decontamination_Protocols_Webinar_June_9_2010.ppt and <http://www.fws.gov/northeast/whitenose/FINALDisinfectionProtocolforBatFieldResearchJune2009.pdf>

- US Fish and Wildlife Service (USFWS). 2011a. Habitat Conservation Plan in Development - Indiana Bat. Fowler Ridge Wind Energy Facility, Benton County, Indiana. Overview and Background. Updated May 25, 2011. Online at: <http://www.fws.gov/midwest/Endangered/permits/hcp/FowlerRidge/FowlerRidgeSummary.html>
- US Fish and Wildlife Service (USFWS). 2011b. Indiana Bat Fatality at Pennsylvania Wind Facility. Pennsylvania Field Office News, Northeast Region, USFWS Last updated October 12, 2011.
- US Fish and Wildlife Service (USFWS). 2012a. 2011 Rangewide Population Estimate for the Indiana Bat (*Myotis sodalis*) by USFWS Region. USFWS Endangered Species Program: Midwest Region. Compiled by A. King, Ecological Services Field Office, USFWS, Bloomington, Indiana. Revised January 4, 2012. Available online at: <http://www.fws.gov/midwest/Endangered/mammals/inba/pdf/2011inbaPopEstimate04Jan12.pdf>
- US Fish and Wildlife Service (USFWS). 2012b. Indiana Bat Fatality at West Virginia Wind Facility. West Virginia Field Office, Northeast Region, USFWS. Last updated August 23, 2012. Available online at: <http://www.fws.gov/westvirginiafieldoffice/ibatfatality.html>
- US Geological Survey (USGS). 2012. The National Map/US Topo. Last updated January 24, 2012. Homepage available at: <http://nationalmap.gov/ustopo/index.html>
- US Geological Survey (USGS) National Land Cover Database (NLCD). 2001. Land Use/Land Cover NLCD Data. USGS Headquarters, USGS National Center. Reston, Virginia.
- US Geological Survey (USGS) National Land Cover Database (NLCD). 2006. Land Use/Land Cover, USGS NLCD 2001 Data. USGS Headquarters, USGS National Center. Reston, Virginia.
- Warnecke, L., J.M. Turner, T.K. Bollinger, J.M. Lorch, V. Misra, P.M. Cryan, G. Wibbelt, D.S. Blehert, and C.K.R. Willis. 2012. Inoculation of Bats with European *Geomyces destructans* Supports the Novel Pathogen Hypothesis for the Origin of White-Nose Syndrome. Proceedings of the National Academy of Sciences 109(18): 6999-7003. North American Datum (NAD). 1983. NAD83 Geodetic Datum.

Appendix A. Mist-Net Survey Site Maps



Appendix A1. Overview of 50 mist-net locations at the proposed Emerson Creek Wind Farm Resource Area in Seneca and Huron Counties, Ohio.



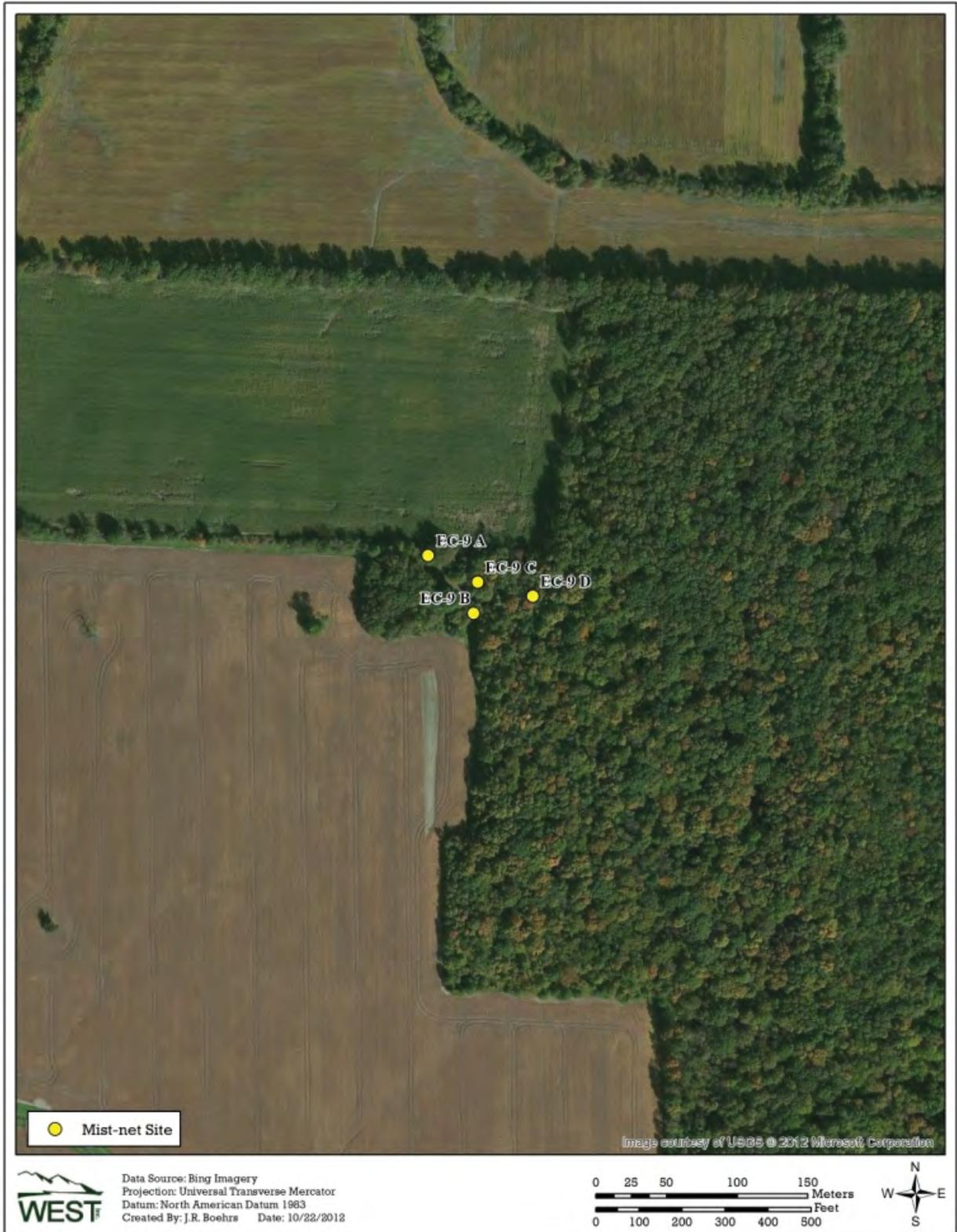
Appendix A2. Aerial view of mist-net site EC-1 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



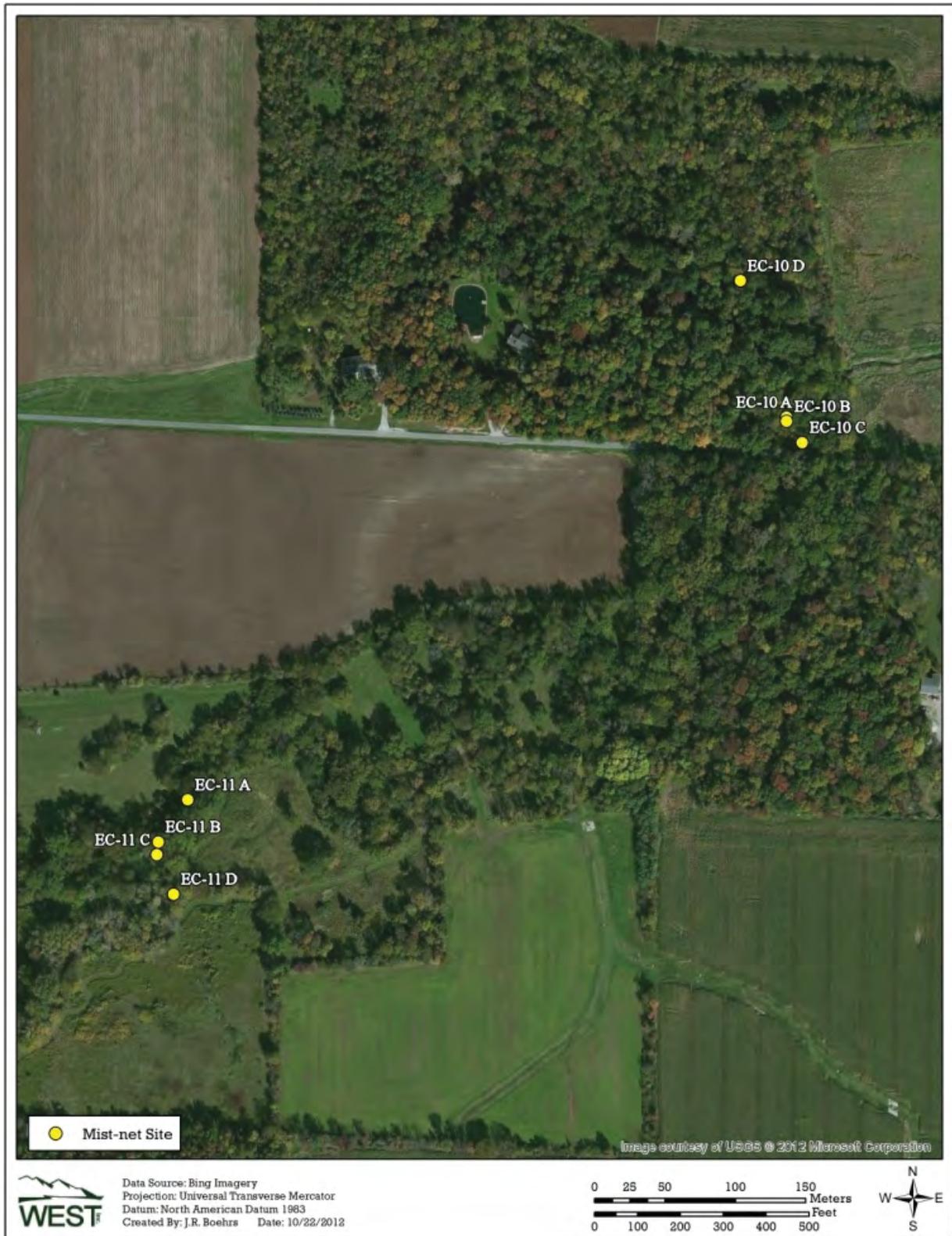
Appendix A3. Aerial view of mist-net site EC-2 and EC-3 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



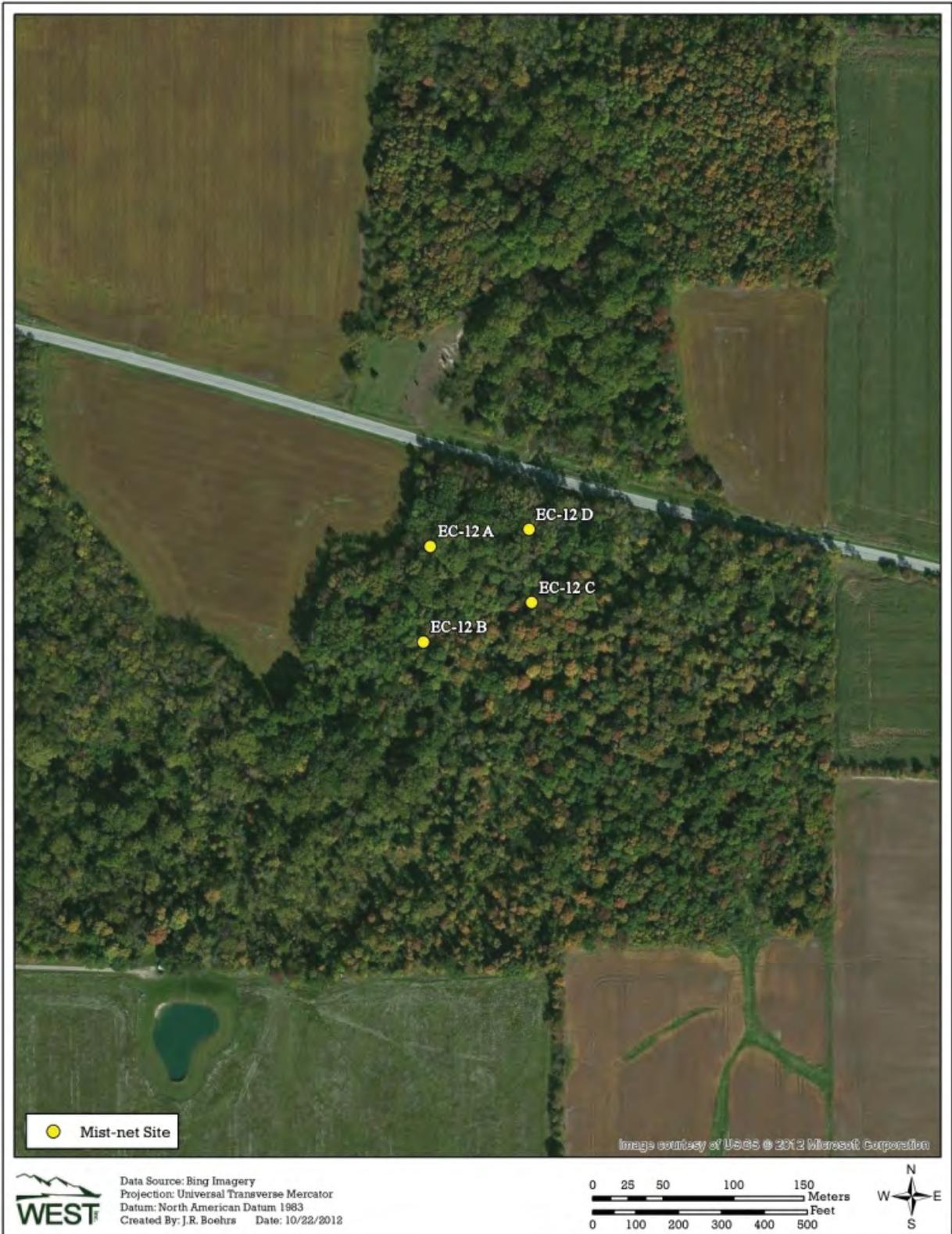
Appendix A4. Aerial view mist-net sites EC-6 and EC-7 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



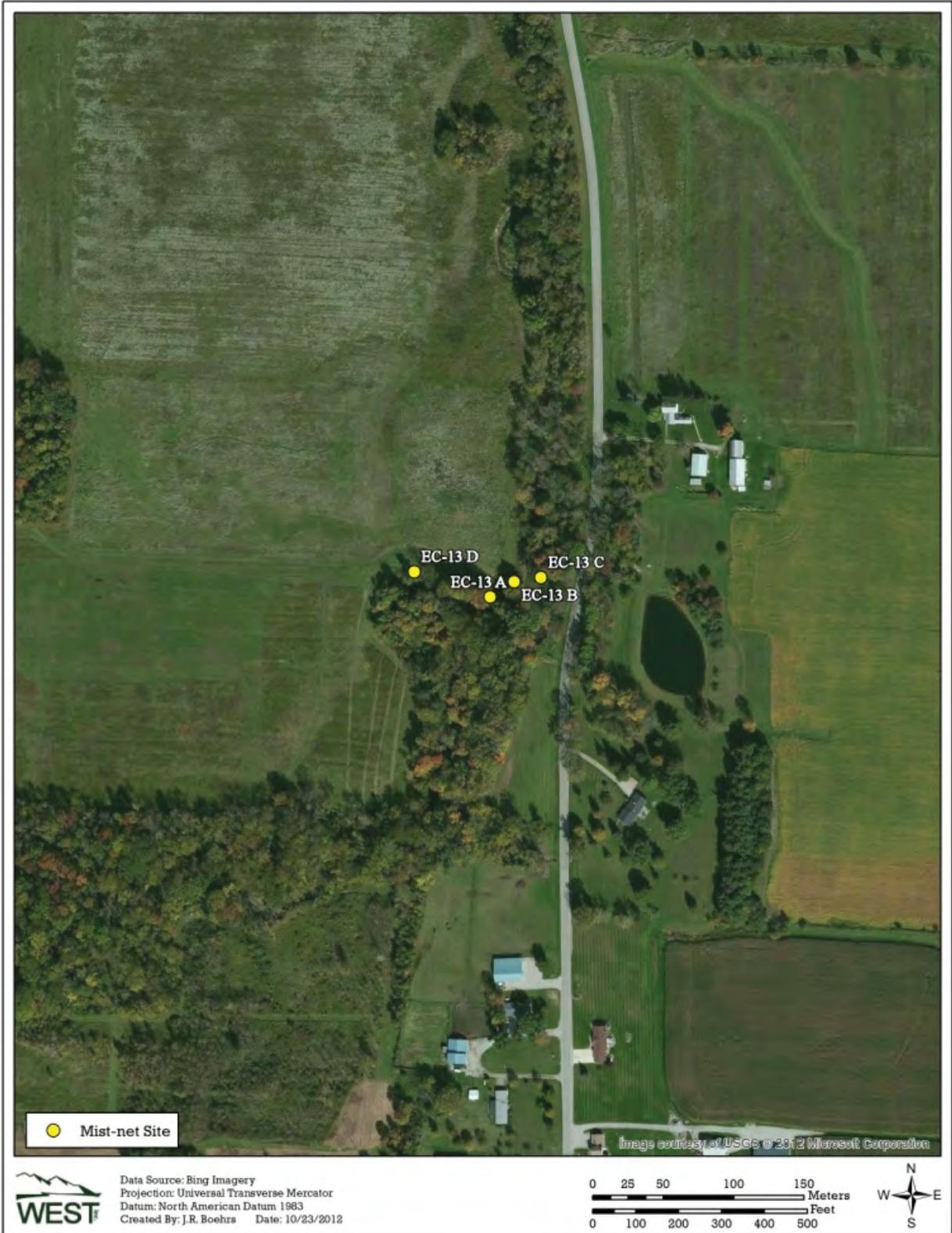
Appendix A5. Aerial view of mist-net site EC-9 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A6. Aerial view of mist-net site EC-10 and EC-11 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



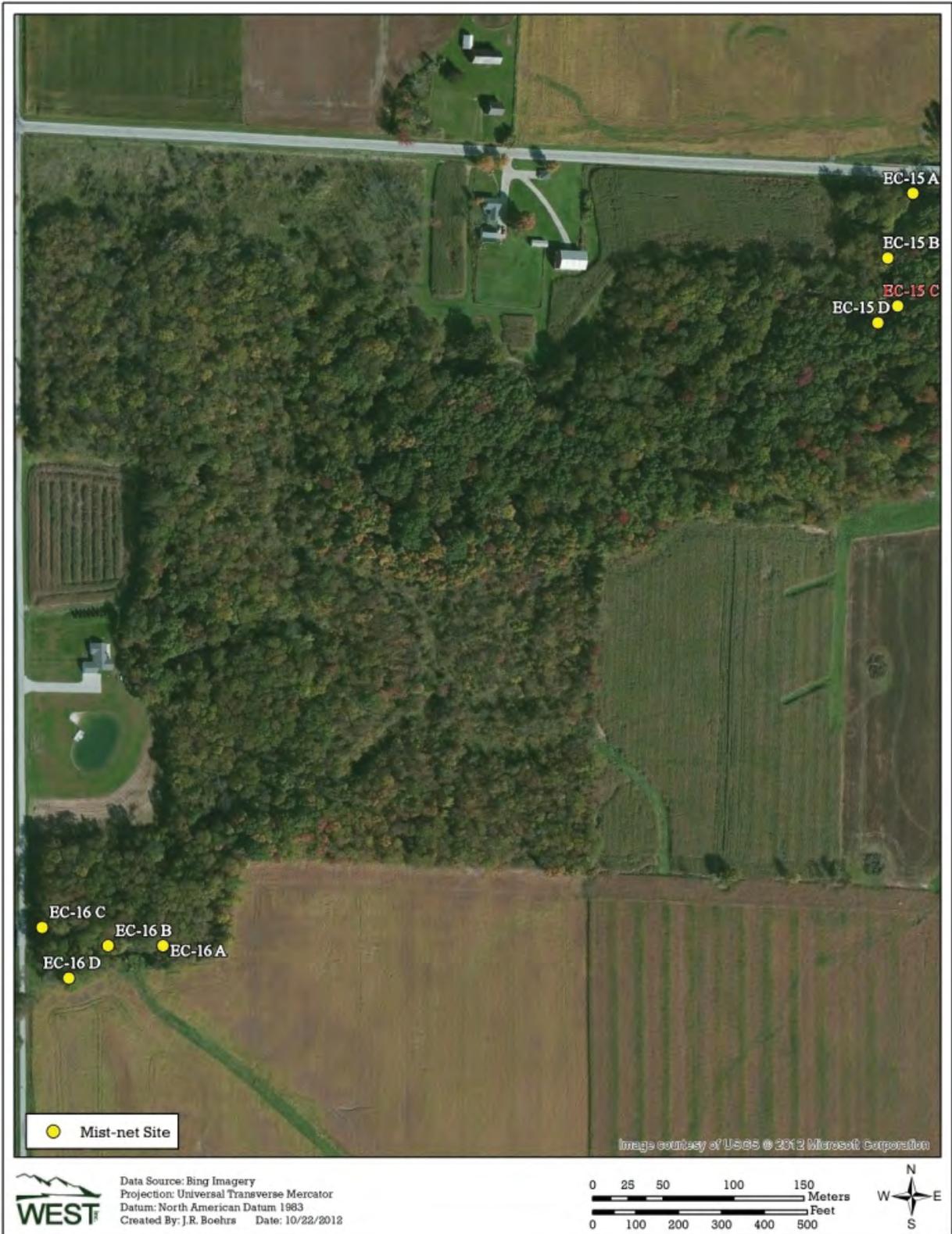
Appendix A7. Aerial view of mist-net site EC-12 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



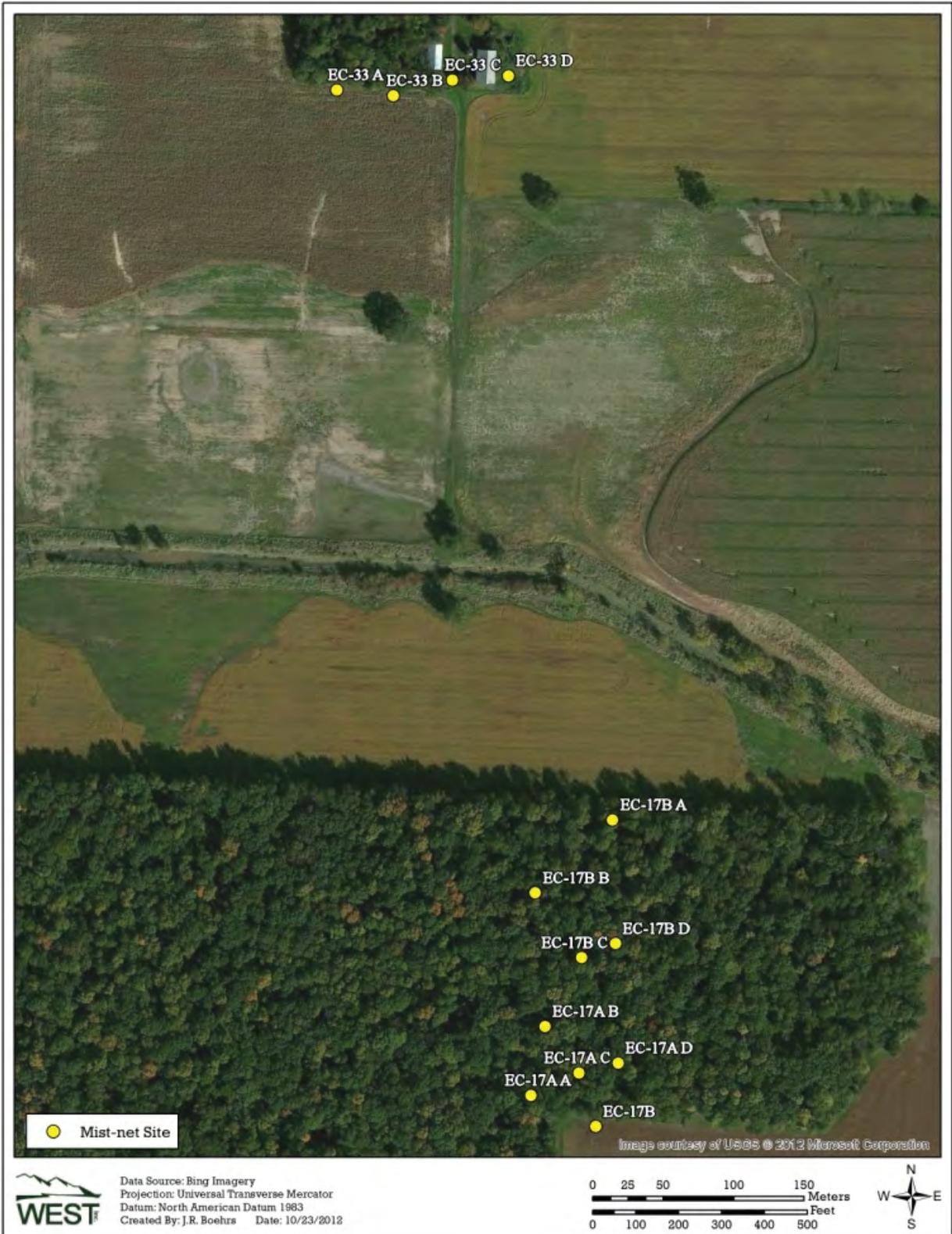
Appendix A8. Aerial view of mist-net site EC-13 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A9. Aerial view of mist-net site EC-14 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



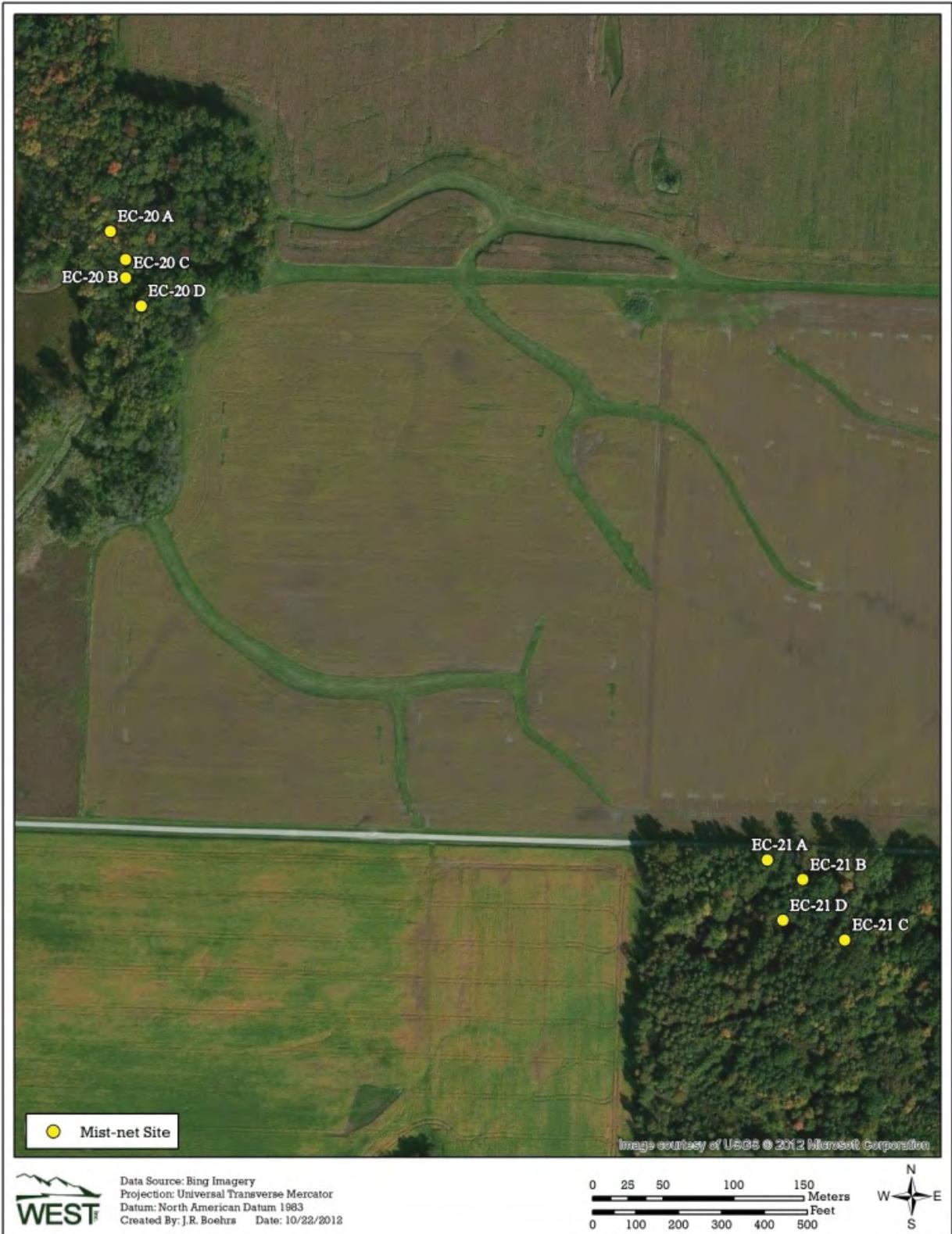
Appendix A10. Aerial view of mist-net site EC-15 and EC-16 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



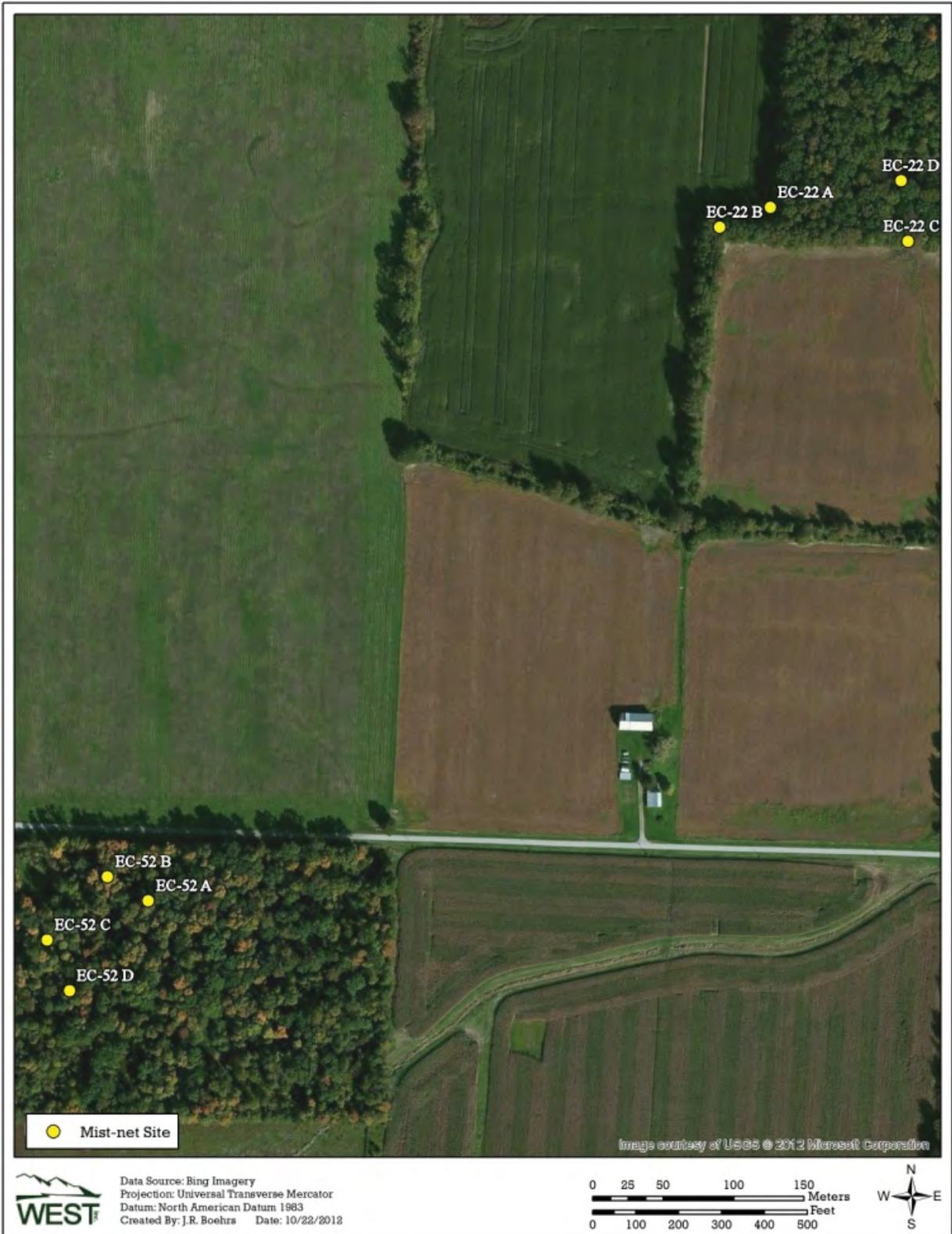
Appendix A11. Aerial view of mist-net sites EC-17A, EC-17B, and EC-33 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A12. Aerial view of mist-net sites EC-18 and EC-19 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A13. Aerial view of mist-net site EC-20 and EC-21 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A14. Aerial view of mist-net site EC-22 and EC-52 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



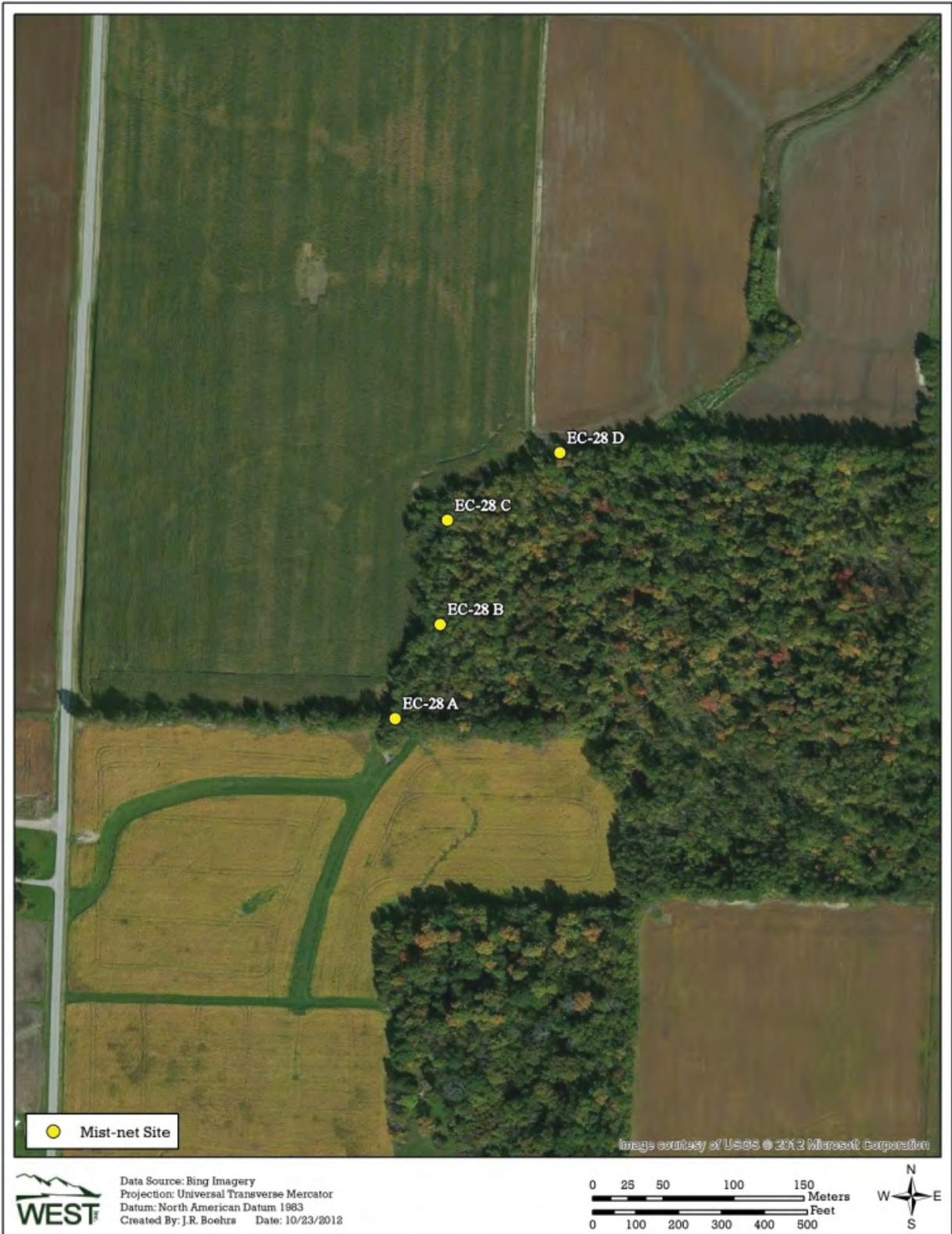
Appendix A15. Aerial view of mist-net sites EC-23A and EC-23B at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A16. Aerial view of mist-net sites EC-26 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A17. Aerial view of mist-net site EC-27 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A18. Aerial view of mist-net site EC-28 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



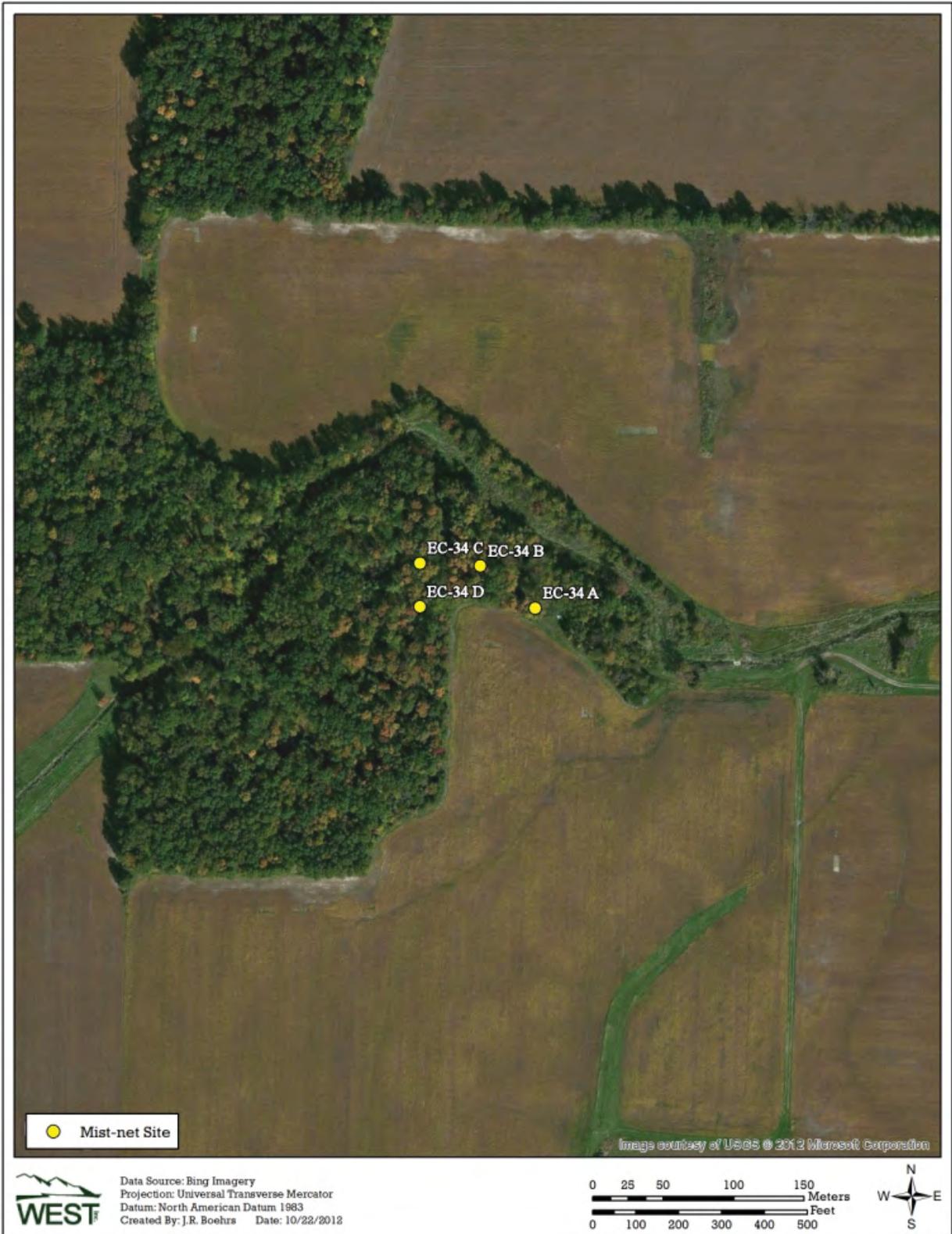
Appendix A19. Aerial view of mist-net site EC-29 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



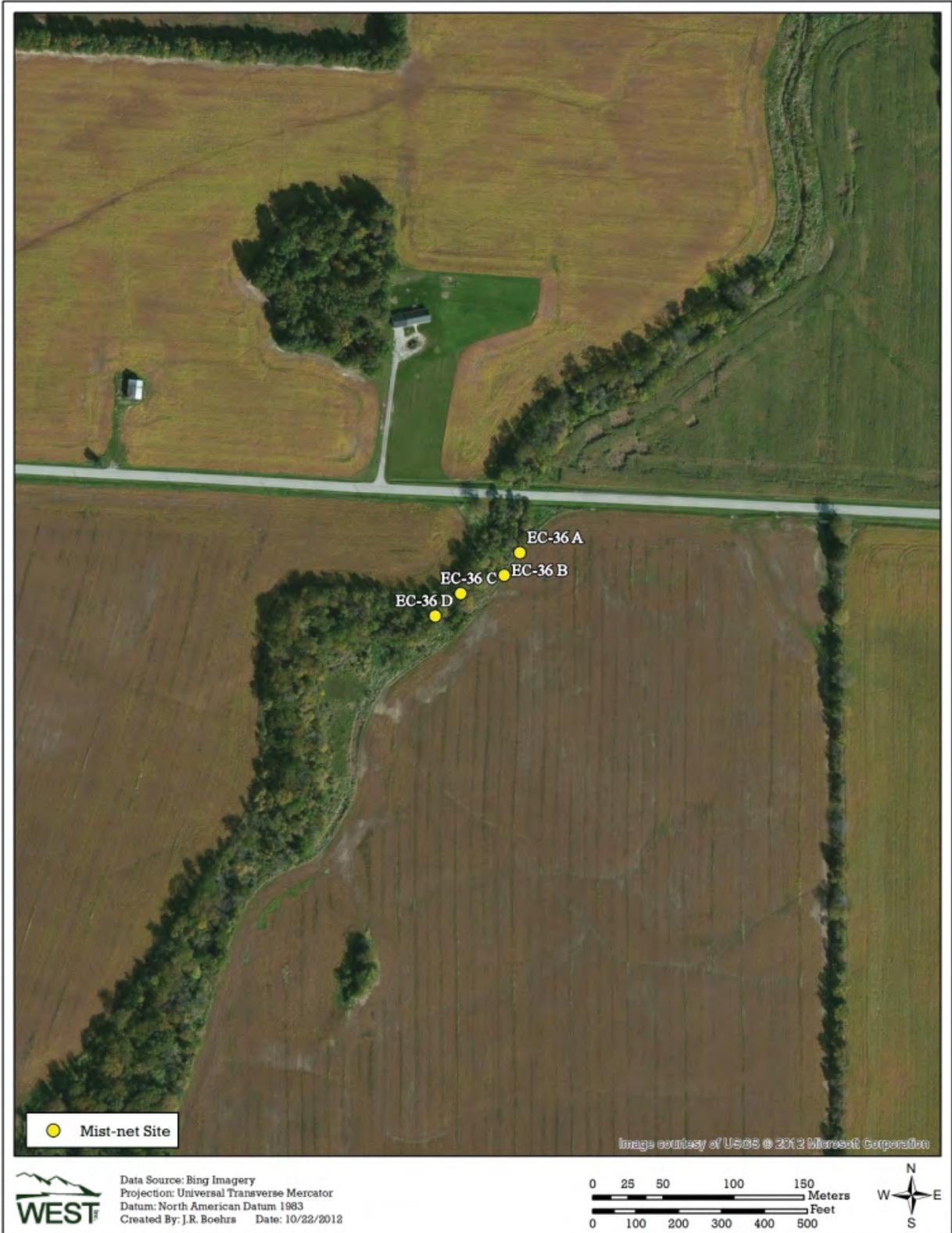
Appendix A20. Aerial view of mist-net site EC-30 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A21. Aerial view of mist-net site EC-32 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A22. Aerial view of mist-net site EC-34 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A23. Aerial view of mist-net site EC-36 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A24. Aerial view of mist-net site EC-37 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A25. Aerial view of mist-net site EC-38 and EC-39 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



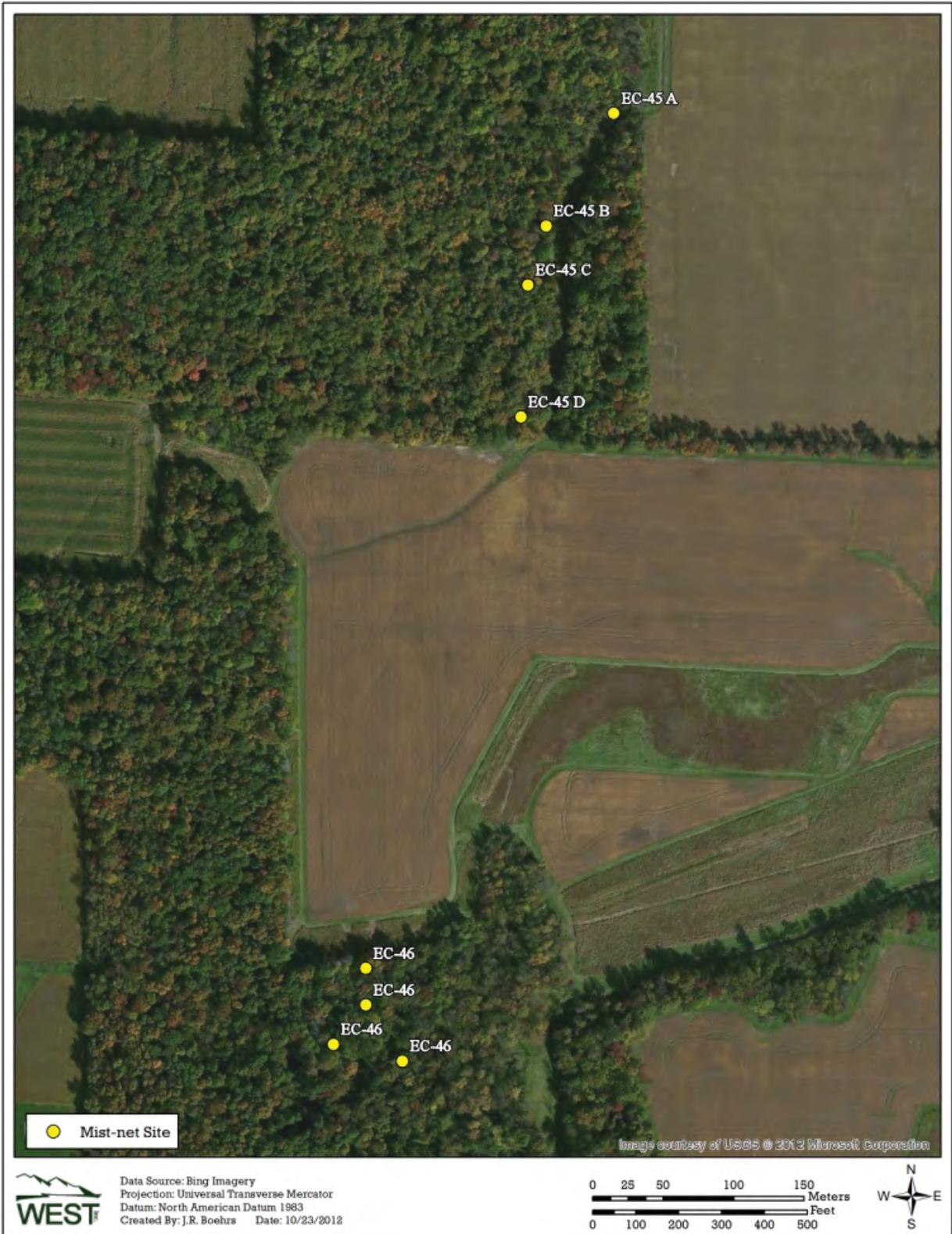
Appendix A26. Aerial view of mist-net site EC-40 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



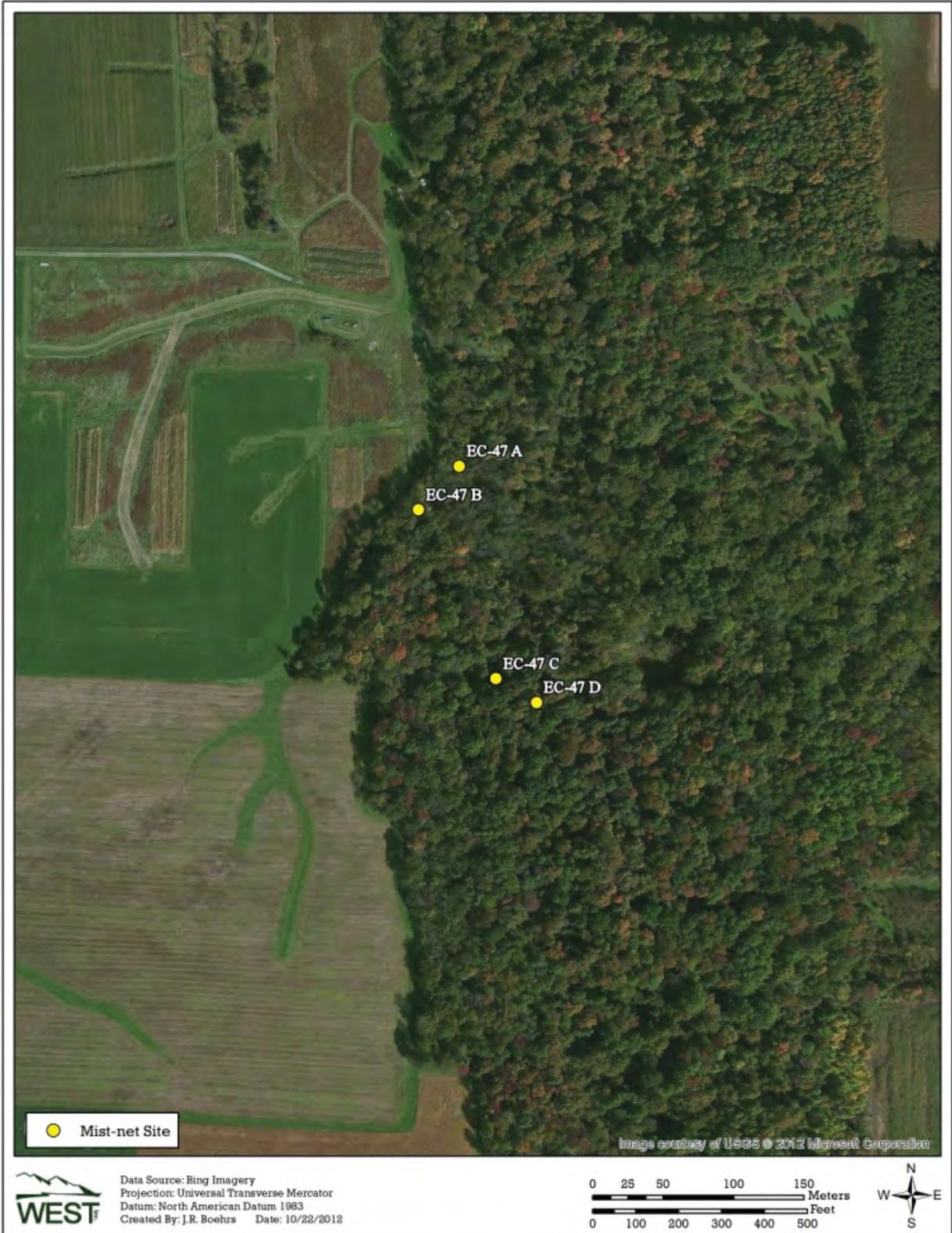
Appendix A27. Aerial view of mist-net site EC-42 and EC-55 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A28. Aerial view of mist-net site EC-44 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



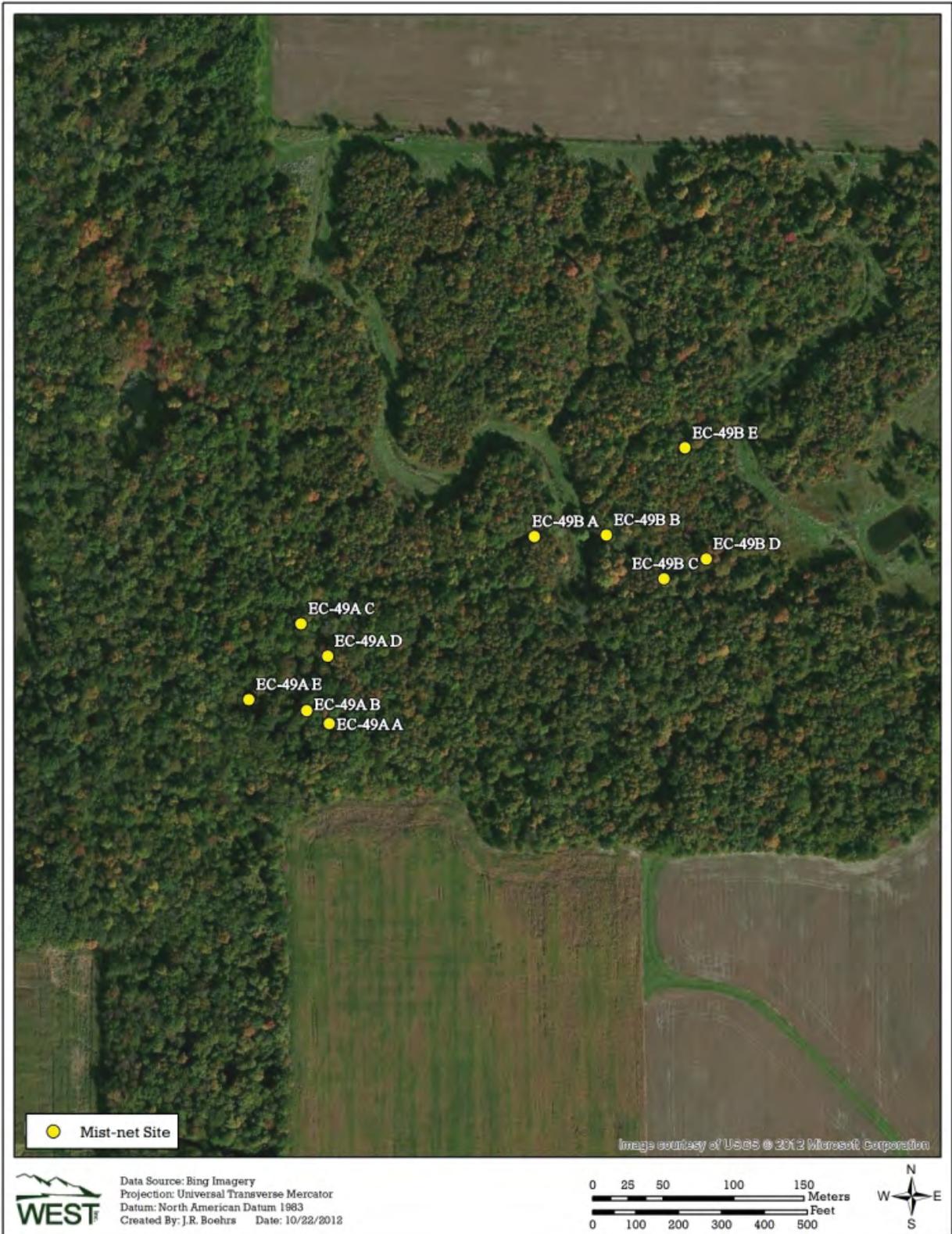
Appendix A29. Aerial view of mist-net site EC-45 and EC-46 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A30. Aerial view of mist-net site EC-47 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



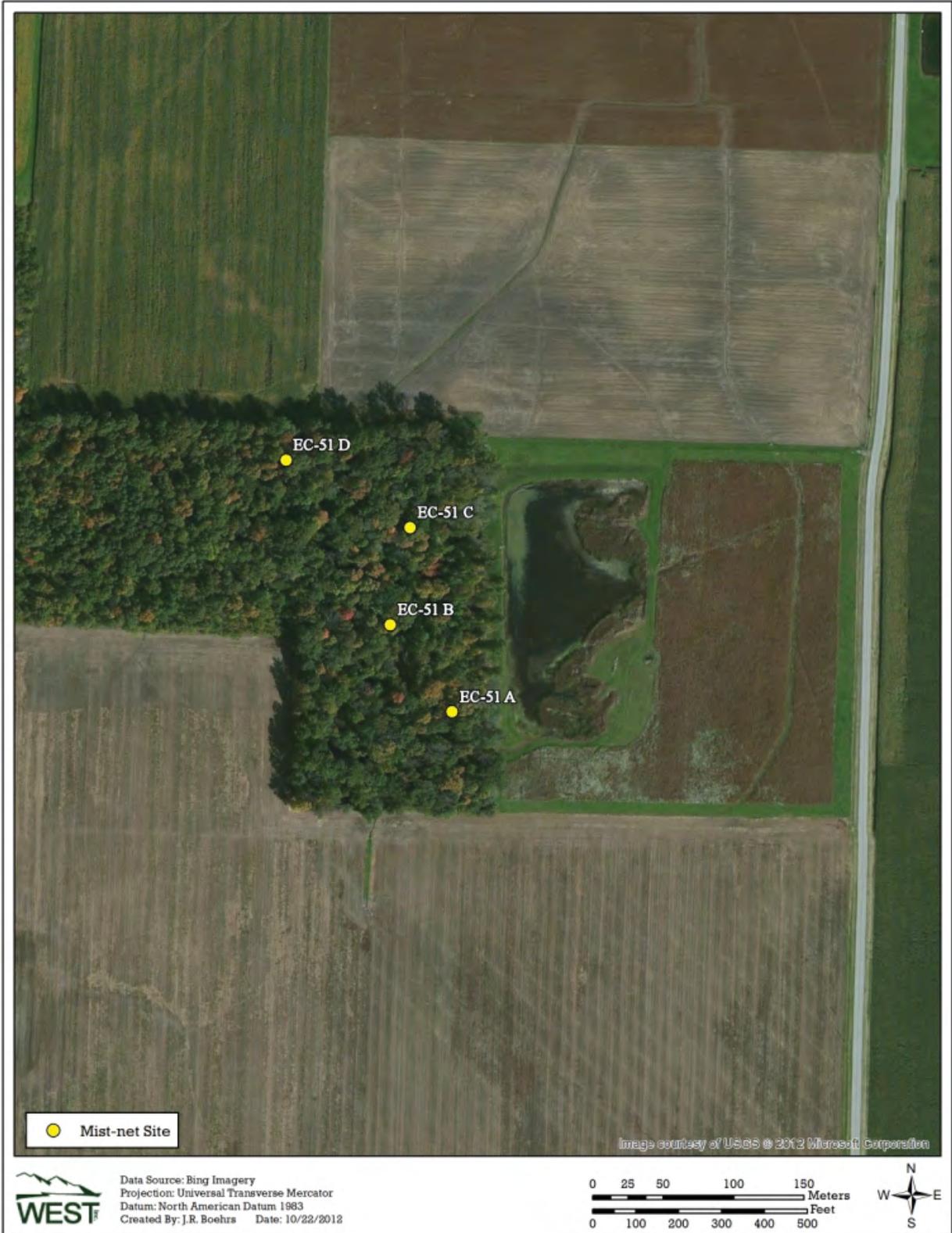
Appendix A31. Aerial view of mist-net site EC-48 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A32. Aerial view of mist-net site EC-49A and EC-49B at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A33. Aerial view of mist-net site EC-50A and EC-50B at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A34. Aerial view of mist-net site EC-51 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A35. Aerial view of mist-net site EC-53 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.



Appendix A36. Aerial view of mist-net site EC-54 at the proposed Emerson Creek Wind Resource Area in Seneca and Huron Counties, Ohio.

Appendix B. Photographs of Mist-Net Sites

EC-1 Net A



EC-1 Net B



Appendix B1. Bat habitat surveyed by mist-nets at EC-1.

EC-1 Net C



EC-1 Net D



Appendix B1 (*continued*). Bat habitat surveyed by mist-nets at EC-1.

EC-2 Net A



EC-2 Net B



Appendix B2. Bat habitat surveyed by mist-nets at EC-2.

EC-2 Net C



EC-2 Net D



Appendix B2 (continued). Bat habitat surveyed by mist-nets at EC-2.

EC-3 Net A



EC-3 Net B



Appendix B3. Bat habitat surveyed by mist-nets at EC-3.

EC-3 Net C



EC-3 Net D

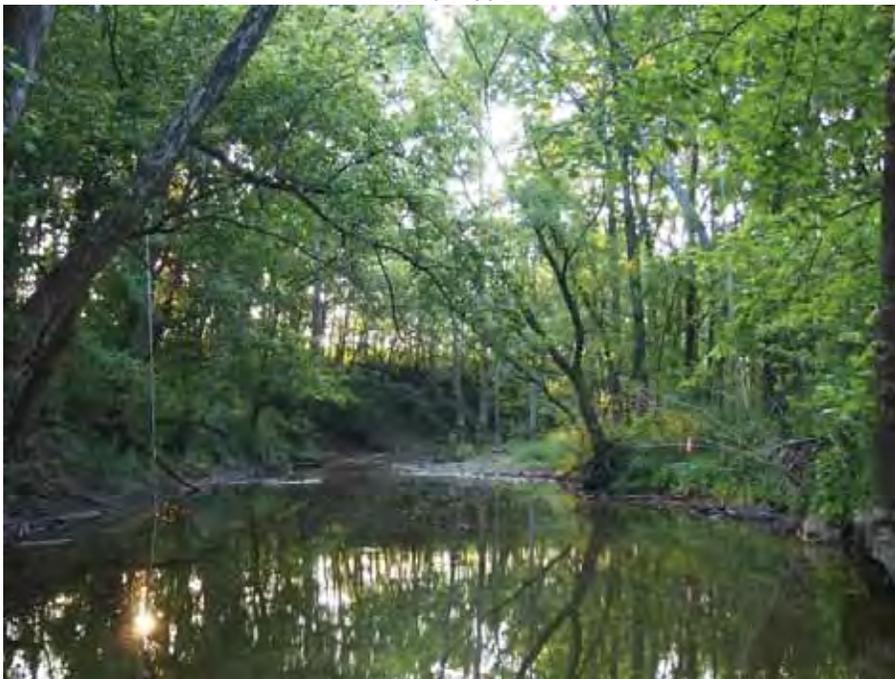


Appendix B3 (*continued*). Bat habitat surveyed by mist-nets at EC-3.

EC-6 Net A



EC-6 Net B



Appendix B4. Bat habitat surveyed by mist-nets at EC-6.

EC6- Net C



EC6- Net D



Appendix B4 (*continued*). Bat habitat surveyed by mist-nets at EC-6.

EC-7 Net A



EC-7 Net B



Appendix B5. Bat habitat surveyed by mist-nets at EC-7.

EC-7 Net C



EC-7 Net D



Appendix B5 (continued). Bat habitat surveyed by mist-nets at EC-7.

EC-9 Net A



EC-9 Net B



Appendix B6. Bat habitat surveyed by mist-nets at EC-9.

EC-9 Net C



EC-9 Net D



Appendix B6 (continued). Bat habitat surveyed by mist-nets at EC-9.

EC-10 Net A



EC-10 Net B



Appendix B7. Bat habitat surveyed by mist-nets at EC-10.

EC-11 Net A



EC-11 Net B



Appendix B8. Bat habitat surveyed by mist-nets at EC-11.

EC-11 Net C



EC-11 Net D



Appendix B8 (*continued*). Bat habitat surveyed by mist-nets at EC-11.

EC-12 Net A



EC-12 Net B



Appendix B9. Bat habitat surveyed by mist-nets at EC-12.

EC-12 Net C



EC-12 Net D

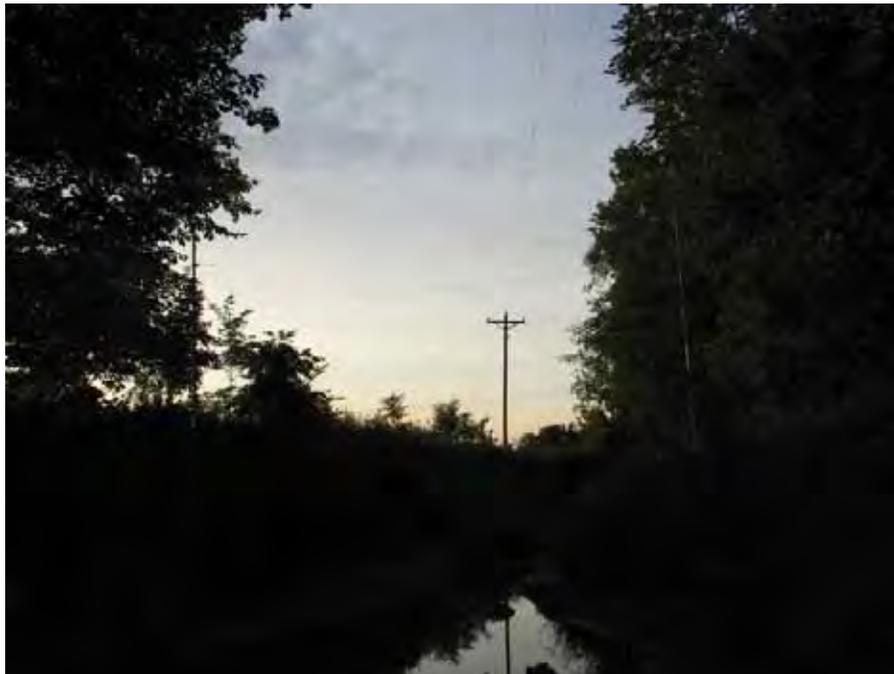


Appendix B9 (continued). Bat habitat surveyed by mist-nets at EC-12.

EC-13 Net A



EC-13 Net B



Appendix B10. Bat habitat surveyed by mist-nets at EC-13.

EC-13 Net C



EC-13 Net D

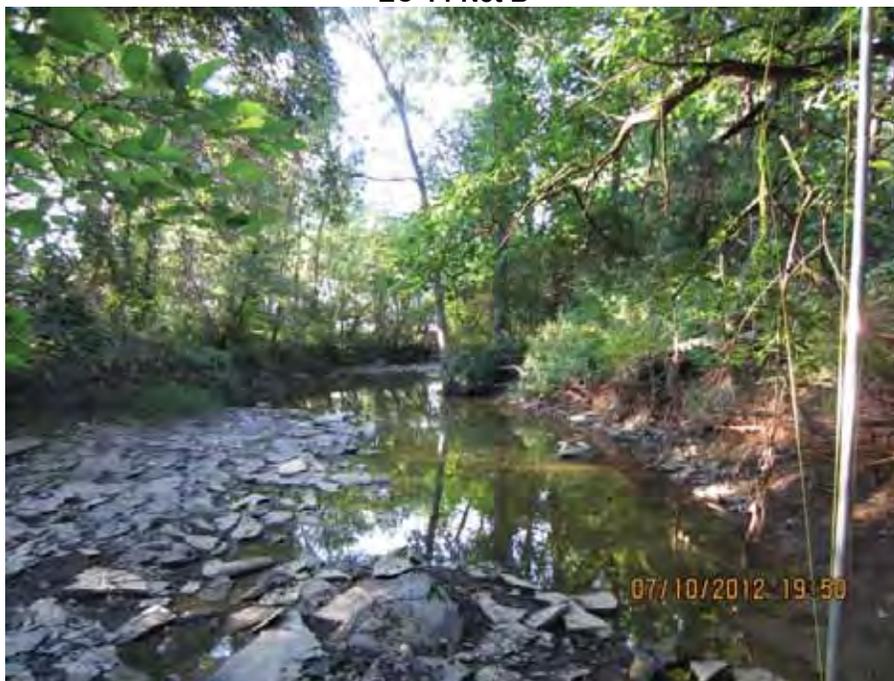


Appendix B10 (*continued*). Bat habitat surveyed by mist-nets at EC-13.

EC-14 Net A



EC-14 Net B



Appendix B11. Bat habitat surveyed by mist-nets at EC-14.

EC-14 Net C



EC-14 Net D



Appendix B11 (*continued*). Bat habitat surveyed by mist-nets at EC-14.

EC-15 Net A



EC-15 Net B



Appendix B12. Bat habitat surveyed by mist-nets at EC-15.

EC-15 Net C



EC-15 Net D



Appendix B12 (continued). Bat habitat surveyed by mist-nets at EC-15.

EC-16 Net A



EC-16 Net B



Appendix B13. Bat habitat surveyed by mist-nets at EC-16.

EC-16 Net C



EC-16 Net D



Appendix B13 (continued). Bat habitat surveyed by mist-nets at EC-16.

EC-17A Net A



EC-17A Net B



Appendix B14. Bat habitat surveyed by mist-nets at EC-17A.

EC-17A Net C



EC-17A Net D



Appendix B14 (*continued*). Bat habitat surveyed by mist-nets at EC-17A.

EC-17B Net A



EC-17B Net B



Appendix B15. Bat habitat surveyed by mist-nets at EC-17B.

EC-17B Net C



EC-17B Net D



Appendix B15 (*continued*). Bat habitat surveyed by mist-nets at EC-17B.

EC18- Net A



EC-18 Net B



Appendix B16. Bat habitat surveyed by mist-nets at EC-18.

EC-18 Net C



EC-18 Net D



Appendix B16 (continued). Bat habitat surveyed by mist-nets at EC-18.

EC-19 Net A



EC-19 Net B



Appendix B17. Bat habitat surveyed by mist-nets at EC-19.

EC-19 Net C



EC-19 Net D



Appendix B17 (*continued*). Bat habitat surveyed by mist-nets at EC-19.

EC-20 Net A



EC-20 Net B



Appendix B18. Bat habitat surveyed by mist-nets at EC-20.

EC-20 Net C



EC-20 Net D



Appendix B18 (continued). Bat habitat surveyed by mist-nets at EC-20.

EC-21 Net A



EC-21 Net B



Appendix B19. Bat habitat surveyed by mist-nets at EC-21.

EC-21 Net C



EC-21 Net D



Appendix B19 (*continued*). Bat habitat surveyed by mist-nets at EC-21.

EC-22 Net A



EC-22 Net B



Appendix B20. Bat habitat surveyed by mist-nets at EC-22.

EC-22 Net C



EC-22 Net D

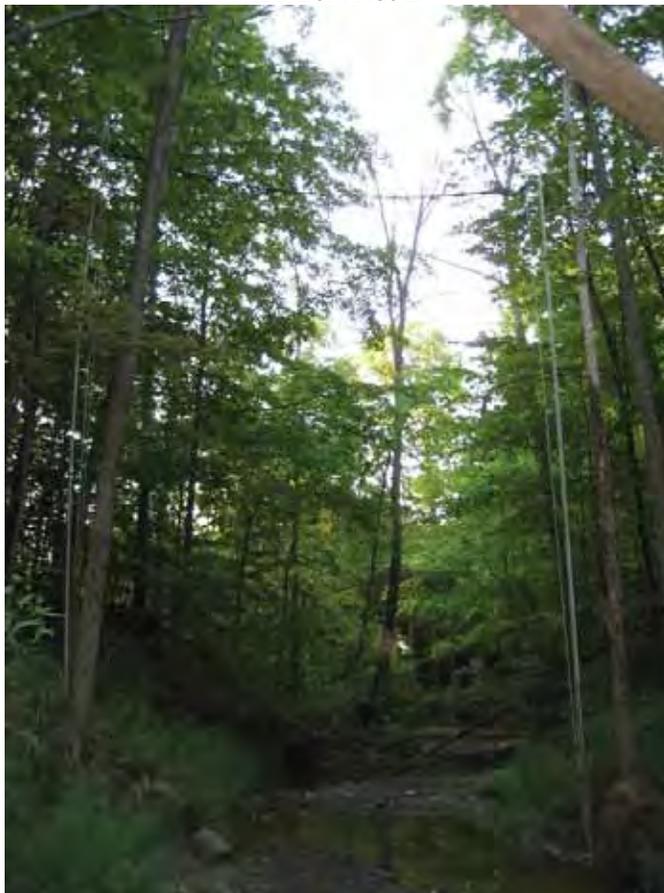


Appendix B20 (*continued*). Bat habitat surveyed by mist-nets at EC-22.

EC-23A Net A



EC-23A Net B



Appendix B21. Bat habitat surveyed by mist-nets at EC-23A.

EC-23A Net C



EC-23A Net D



Appendix B21 (*continued*). Bat habitat surveyed by mist-nets at EC-23A.

EC-23B Net A



EC-23B Net B



Appendix B22. Bat habitat surveyed by mist-nets at EC-23B.

EC-23B Net C



EC-23B Net D



Appendix B22 (continued). Bat habitat surveyed by mist-nets at EC-23B.

EC-26 Net A



EC-26 Net B



Appendix B23. Bat habitat surveyed by mist-nets at EC-26.

EC-26 Net C



EC-26 Net D

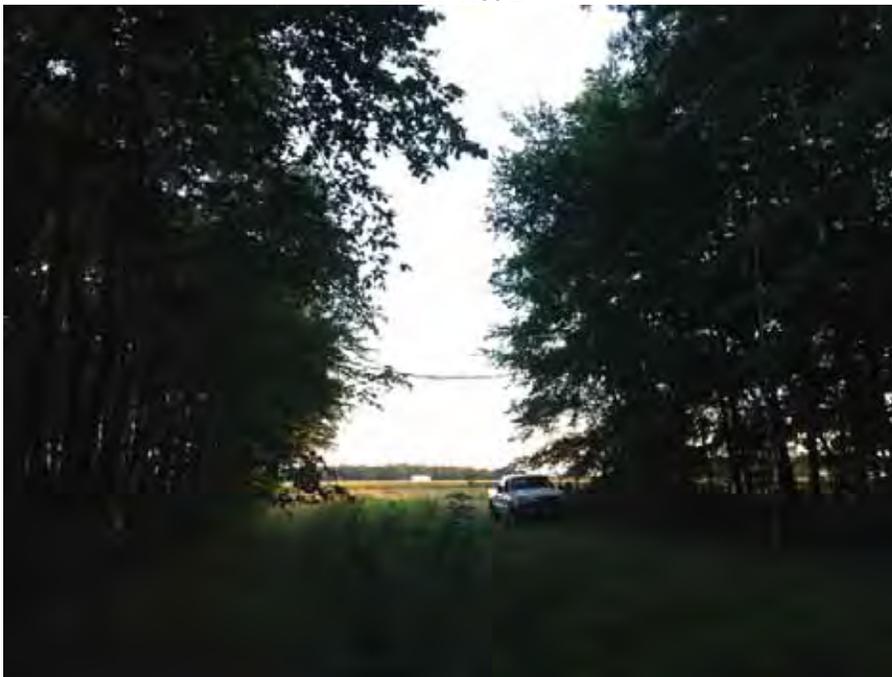


Appendix B23 (continued). Bat habitat surveyed by mist-nets at EC-26.

EC-27 Net A



EC-27 Net B

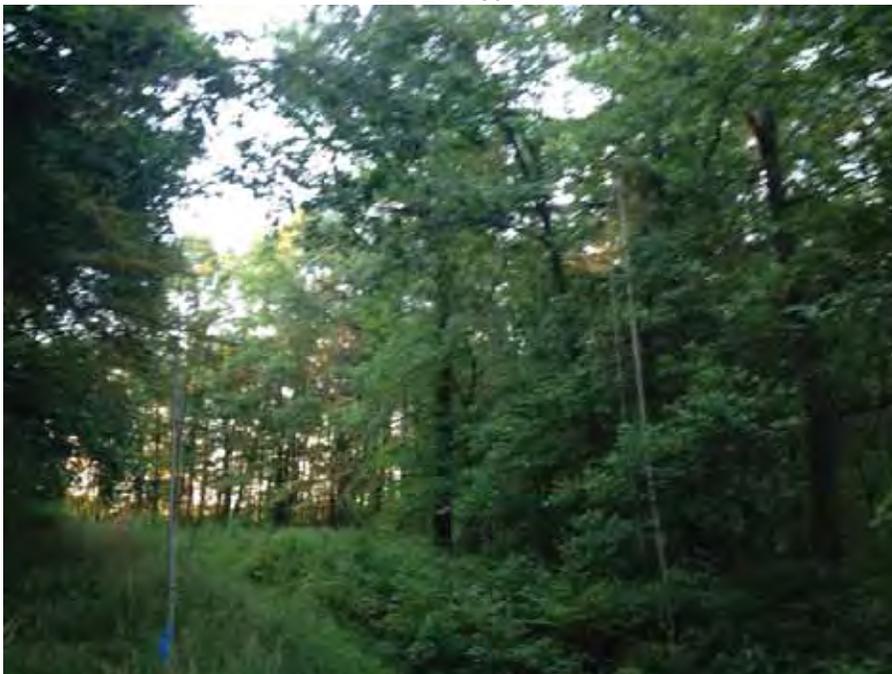


Appendix B24. Bat habitat surveyed by mist-nets at EC-27.

EC-27 Net C



EC-27 Net D



Appendix B24 (continued). Bat habitat surveyed by mist-nets at EC-27.

EC-28 Net A



EC-28 Net B



Appendix B25. Bat habitat surveyed by mist-nets at EC-28.

EC-28 Net C



EC-28 Net D



Appendix B25 (*continued*). Bat habitat surveyed by mist-nets at EC-28.

EC-29 Net A

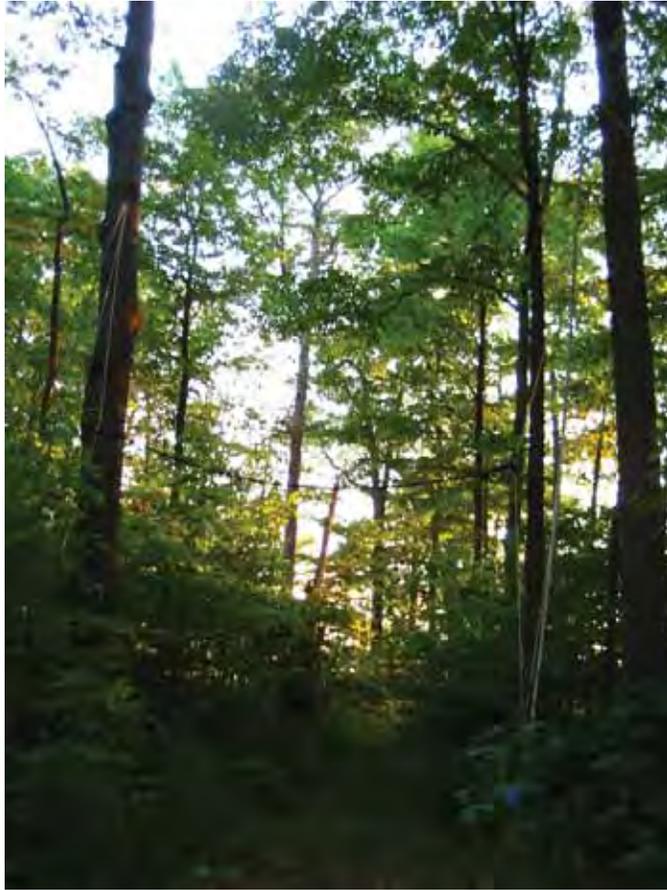


EC-29 Net B



Appendix B26. Bat habitat surveyed by mist-nets at EC-29.

EC-29 Net C



EC-29 Net D



Appendix B26 (*continued*). Bat habitat surveyed by mist-nets at EC-29.

EC-30 Net A



EC-30 Net B



Appendix B27. Bat habitat surveyed by mist-nets at EC-30.

EC-30 Net C



EC-30 Net D

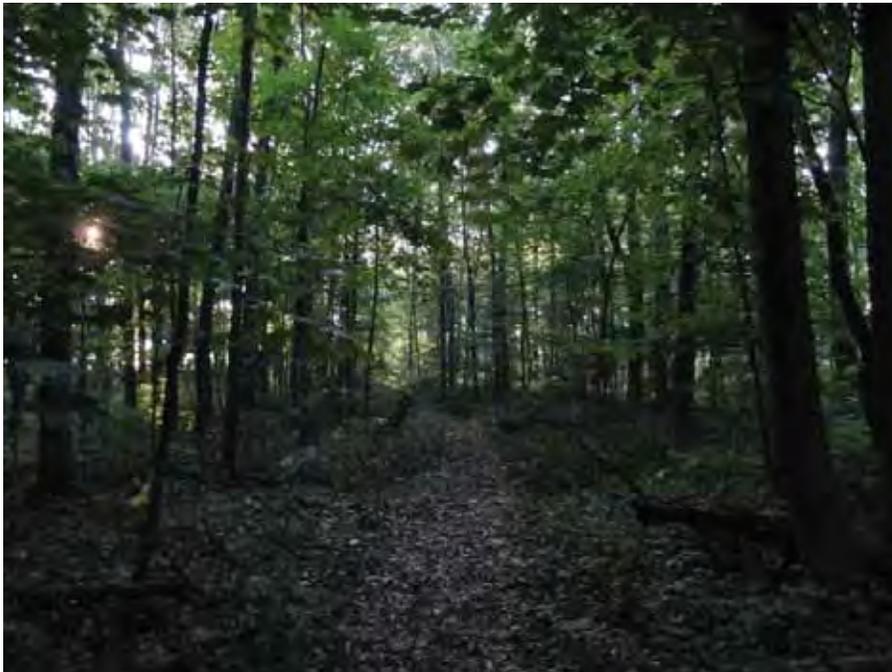


Appendix B27 (continued). Bat habitat surveyed by mist-nets at EC-30.

EC-32 Net A



EC-32 Net B



Appendix B28. Bat habitat surveyed by mist-nets at EC-32.

EC-32 Net C



EC-32 Net D



Appendix B28 (continued). Bat habitat surveyed by mist-nets at EC-32.

EC-33 Net A



EC-33 Net B



Appendix B29. Bat habitat surveyed by mist-nets at EC-33.

EC-33 Net C



EC-33 Net D



Appendix B29 (continued). Bat habitat surveyed by mist-nets at EC-33.

EC-34 Net A



EC-34 Net B



Appendix B30. Bat habitat surveyed by mist-nets at EC-34.

EC-34 Net C



EC-34 Net D

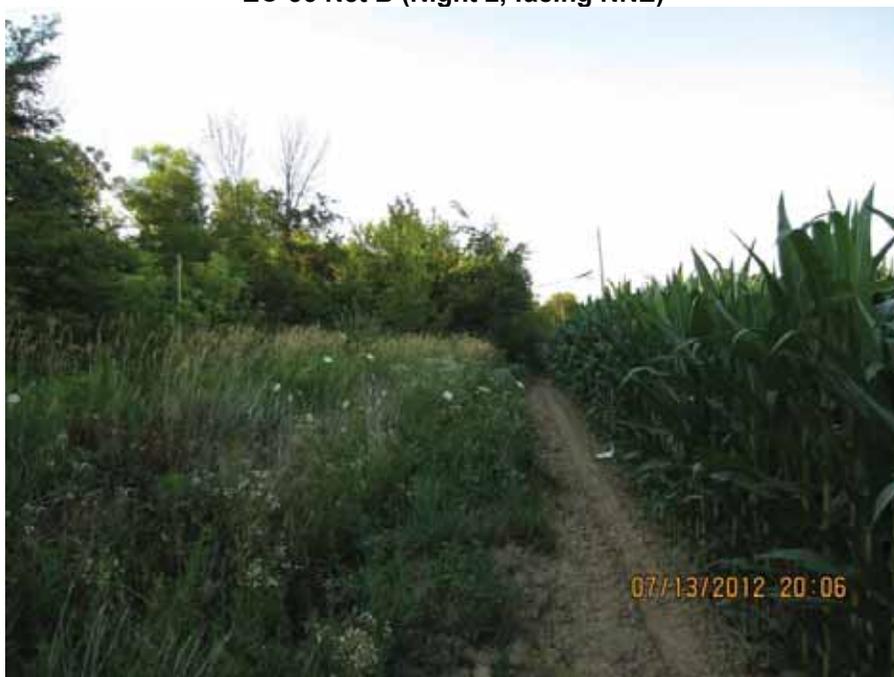


Appendix B30 (*continued*). Bat habitat surveyed by mist-nets at EC-34.

EC-36 Net A

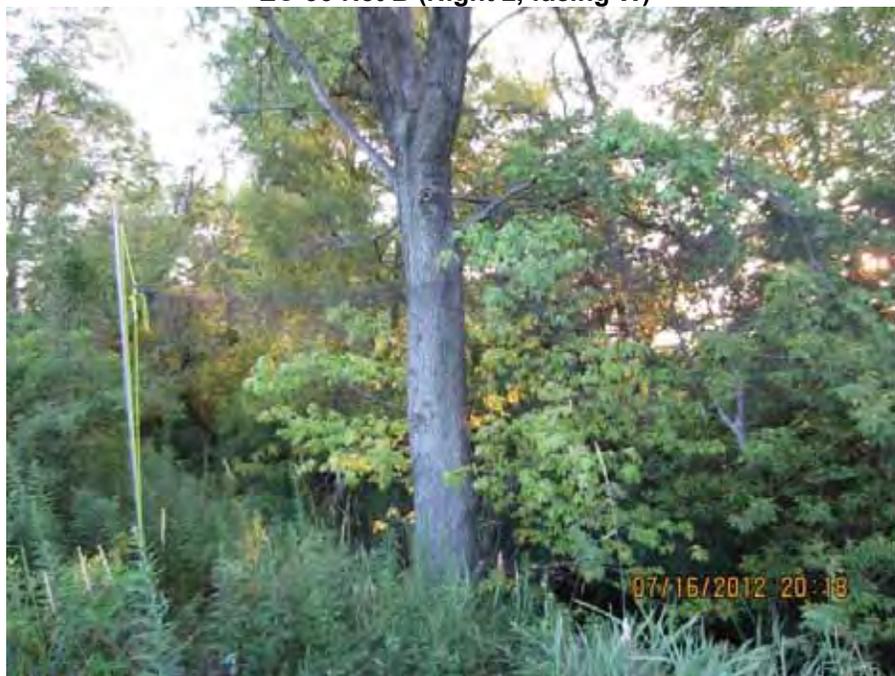


EC-36 Net B (Night 2, facing NNE)



Appendix B31. Bat habitat surveyed by mist-nets at EC-36.

EC-36 Net B (Night 2, facing W)



EC-36 Net C



Appendix B31 (continued). Bat habitat surveyed by mist-nets at EC-36.

EC-26 Net D



Appendix B31 (*continued*). Bat habitat surveyed by mist-nets at EC-36.

EC-37 Net A



EC-37 Net B



Appendix B32. Bat habitat surveyed by mist-nets at EC-37.

EC-37 Net C



EC-37 Net D

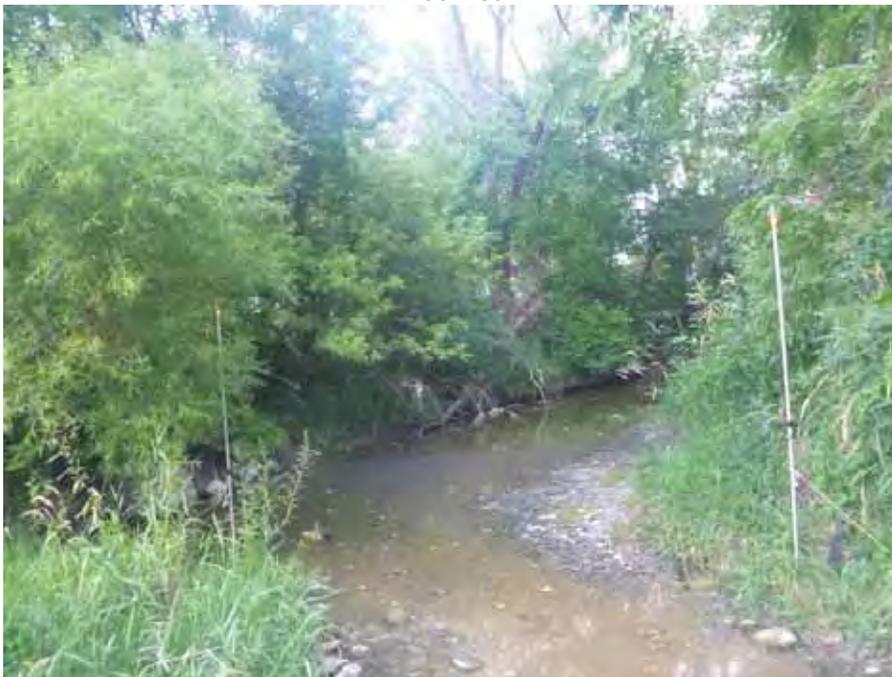


Appendix B32 (continued). Bat habitat surveyed by mist-nets at EC-37.

EC-38 Net A



EC-38 Net B



Appendix B33. Bat habitat surveyed by mist-nets at EC-38.

EC-38 Net C



EC-38 Net D



Appendix B33 (continued). Bat habitat surveyed by mist-nets at EC-38.

EC-38 Net E



Appendix B33 (*continued*). Bat habitat surveyed by mist-nets at EC-38.

EC-39 Net A



EC-39 Net B



Appendix B34. Bat habitat surveyed by mist-nets at EC-39.

EC-39 Net C



EC-39 Net D



Appendix B34 (*continued*). Bat habitat surveyed by mist-nets at EC-39.

EC-40 Net A



EC-40 Net B



Appendix B35. Bat habitat surveyed by mist-nets at EC-40.

EC-40 Net C



EC-40 Net D

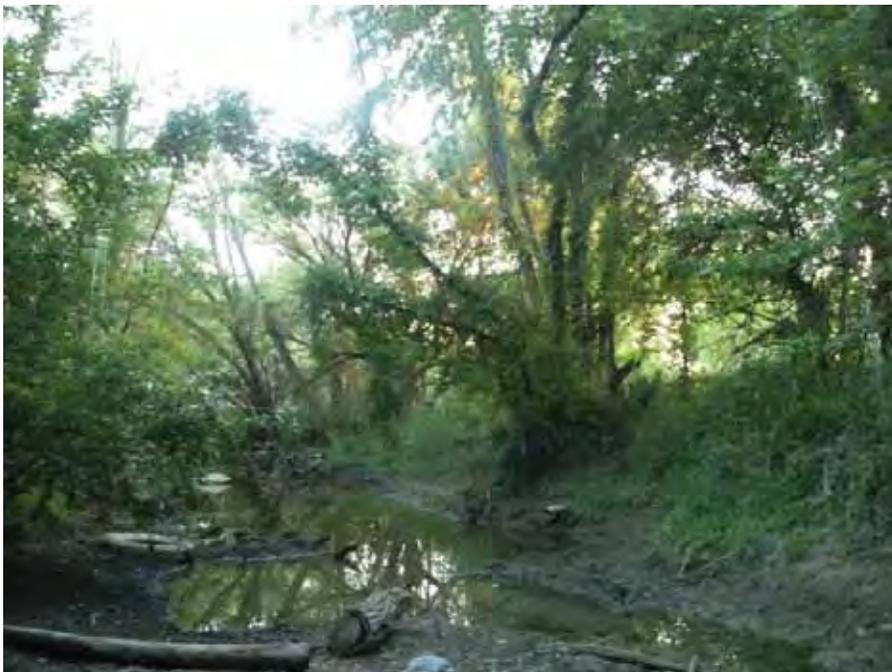


Appendix B35 (continued). Bat habitat surveyed by mist-nets at EC-40.

EC-42 Net A



EC-42 Net B



Appendix B36. Bat habitat surveyed by mist-nets at EC-42.

EC-42 Net C



EC-42 Net D



Appendix B36 (continued). Bat habitat surveyed by mist-nets at EC-42.

EC-44 Net A



EC-44 Net B



Appendix B37. Bat habitat surveyed by mist-nets at EC-44.

EC-44 Net C



EC-44 Net D



Appendix B37 (*continued*). Bat habitat surveyed by mist-nets at EC-44.

EC-45 Net A



EC-45 Net B



Appendix B38. Bat habitat surveyed by mist-nets at EC-45.

EC-45 Net C



EC-45 Net D



Appendix B38 (continued). Bat habitat surveyed by mist-nets at EC-45.

EC-46 Net A



EC-46 Net B



Appendix B39. Bat habitat surveyed by mist-nets at EC-46.

EC-46 Net C



EC-46 Net D



Appendix B39 (continued). Bat habitat surveyed by mist-nets at EC-46.

EC-47 Net A



EC-47 Net B



Appendix B40. Bat habitat surveyed by mist-nets at EC-47.

EC-47 Net C



EC-47 Net D



Appendix B40 (continued). Bat habitat surveyed by mist-nets at EC-47.

EC-48 Net A



EC-48 Net B



Appendix B41. Bat habitat surveyed by mist-nets at EC-48.

EC-48 Net C



EC-48 Net D



Appendix B41 (*continued*). Bat habitat surveyed by mist-nets at EC-48.

EC-49A Net A



EC-49A Net B



Appendix B42. Bat habitat surveyed by mist-nets at EC-49A.

EC-49A Net C



EC-49A Net D



Appendix B42 (*continued*). Bat habitat surveyed by mist-nets at EC-49A.

EC-49A Net E



Appendix B42 (*continued*). Bat habitat surveyed by mist-nets at EC-49A.

EC-49B Net B



EC-49B Net C



Appendix B43. Bat habitat surveyed by mist-nets at EC-49B.

EC-49B Net D

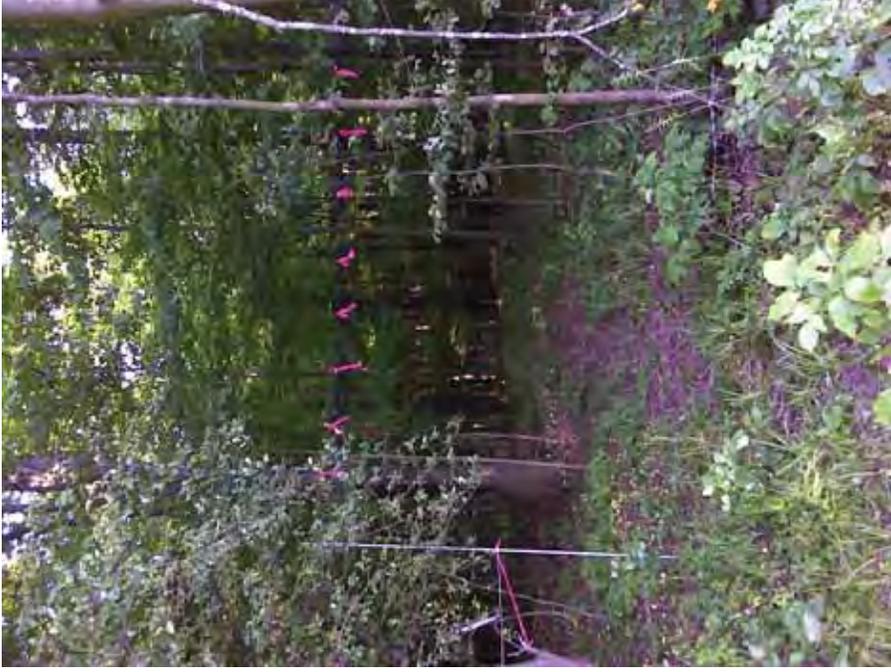


EC-49B Net E



Appendix B43 (*continued*). Bat habitat surveyed by mist-nets at EC-49B.

EC-50A Net A



EC-50A Net B



Appendix B44. Bat habitat surveyed by mist-nets at EC-50A.

EC-50A Net C



EC-50A Net D



Appendix B44 (continued). Bat habitat surveyed by mist-nets at EC-50A.

EC-50B Net A



EC-50B Net B



Appendix B45. Bat habitat surveyed by mist-nets at EC-50B.

EC-50B Net C



EC-50B Net D



Appendix B45 (continued). Bat habitat surveyed by mist-nets at EC-50B.

EC-51 Net A



EC-51 Net B



Appendix B46. Bat habitat surveyed by mist-nets at EC-51.

EC-51 Net C



EC-51 Net D



Appendix B46 (continued). Bat habitat surveyed by mist-nets at EC-51.

EC-52 Net A



EC-52 Net B



Appendix B47. Bat habitat surveyed by mist-nets at EC-52.

EC-52 Net C



EC-52 Net D



Appendix B47 (*continued*). Bat habitat surveyed by mist-nets at EC-52.

EC-53 Net A



EC-53 Net B



Appendix B48. Bat habitat surveyed by mist-nets at EC-53.

EC-53 Net C



EC-53 Net D



Appendix B48 (continued). Bat habitat surveyed by mist-nets at EC-53.

EC-54 Net A



EC-54 Net B



Appendix B49. Bat habitat surveyed by mist-nets at EC-54.

EC-54 Net C



EC-54 Net D



Appendix B49 (continued). Bat habitat surveyed by mist-nets at EC-54.

EC-55 Net A



EC-55 Net B



Appendix B50. Bat habitat surveyed by mist-nets at EC-55.

EC-55 Net C



EC-55 Net D



Appendix B50 (continued). Bat habitat surveyed by mist-nets at EC-55.

Appendix C. Photographs of Captured Bats

Little Brown Bat: Frontal View



Little Brown Bat Captured at EC15: Face



Appendix C1. Little brown bat captured at the Emerson Creek Wind Resource Area.

Little Brown Bat Captured at EC-9 Net C: Foot (Note Lack of Keeled Calcar)



Appendix C1 (continued). Little brown bat captured at the Emerson Creek Wind Resource Area.

Juvenile Tri-Colored Bat Captured at EC-7: Wing



Juvenile Tri-Colored Bat Captured at EC-7: Face and Pelage



Appendix C2. Tri-colored bat captured at the Emerson Creek Wind Resource Area.

Northern Long-Eared Bat: Side View



Northern Long-Eared Bat: Ventral View and Wing



Appendix C3. Northern long-eared bats captured at the Emerson Creek Wind Resource Area.

Big Brown Bat: Face



Big Brown Bat Captured at EC-16: Frontal View, Face, and Pelage



Appendix C4. Big brown bats captured at the Emerson Creek Wind Resource Area.

Big Brown Bat: Dorsal Wing



Big Brown Bat: Ventral Wing



Appendix C4 (continued). Big brown bats captured at the Emerson Creek Wind Resource Area.

Hoary Bat Captured at EC-3: Frontal View of Head



Hoary Bat Captured at EC-50A Net C: Wings



Appendix C5. Hoary bats captured at the Emerson Creek Wind Resource Area.

Hoary Bat: Dorsal View and Pelage



Hoary Bat Captured at EC-14: Dorsal View, Wings, and Pelage



Appendix C5 (*continued*). Hoary bats captured at the Emerson Creek Wind Resource Area.

Eastern Red Bat: Frontal View and Face



Eastern Red Bat: Frontal View and Face



Appendix C6. Eastern red bats captured at the Emerson Creek Wind Resource Area.

Appendix D. Photographs of Little Brown Bat Roost in Barn

Little Brown Bat Roost: Exterior



Little Brown Bat: Interior and Loose Boards



Appendix D. Little brown bat roost in a barn at the Emerson Creek Wind Resource Area.

Little Brown Bat Roost: Roosting Bats in the Maternity Colony Under Loose Board



Appendix D (continued). Little brown bat roost in a barn at the Emerson Creek Wind Resource Area.

Appendix E. Summary of Mist-Net Captures

Appendix E1. Details of bats captured at mist-net site EC-1; July 9 and 11, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 9						
big brown bat	Female	Adult	lactating	0	19.8	46.6
big brown bat	Female	Adult	lactating	0	19.4	50.2
big brown bat	Male	Juvenile	non-reproductive	0	12.3	46.0
big brown bat	Male	Juvenile	non-reproductive	0	15.3	46.7
big brown bat	Female	Adult	lactating	0	20.0	45.9
eastern red bat	Female	Adult	post-lactating	0	12.3	39.0
eastern red bat	Male	Adult	scrotal	0	15.3	41.2
big brown bat	Female	Adult	post-lactating	0	20.1	46.9
big brown bat	Male	Juvenile	scrotal	0	13.5	44.8
little brown bat	Male	Juvenile	non-reproductive	0	6.8	35.8
big brown bat	Female	Adult	lactating	0	22.8	47.7
big brown bat	Male	Juvenile	non-reproductive	0	13.8	45.2
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.8	35.7
hoary bat	Male	Juvenile	non-reproductive	0	18.5	54.1
big brown bat	Male	Juvenile	scrotal	0	16.3	45.9
hoary bat	Female	Juvenile	non-reproductive	0	22.0	55.3
big brown bat	Female	Adult	lactating	0	19.8	48.1
hoary bat	Male	Juvenile	non-reproductive	0	18.0	52.4
big brown bat	Female	Adult	non-reproductive	0	20.0	47.6
July 11						
eastern red bat	Female	Juvenile	non-reproductive	0	10.8	40.4
big brown bat	Female	Juvenile	non-reproductive	0	12.4	44.7
little brown bat	Female	Adult	non-reproductive	0	8.0	37.8
big brown bat	Male	Adult	scrotal	0	15.0	44.0
big brown bat	Male	Juvenile	non-reproductive	0	14.0	47.8
eastern red bat	----	----	----	----	----	----
big brown bat	Male	Adult	scrotal	0	16.5	47.7
big brown bat	Female	Juvenile	non-reproductive	0	14.1	45.1
big brown bat	Male	Juvenile	non-reproductive	0	14.4	46.3
eastern red bat	----	----	----	----	----	----
eastern red bat	Male	Adult	scrotal	0	11.6	40.2
big brown bat	Male	Adult	scrotal	0	15.9	47.3
eastern red bat	Female	Juvenile	non-reproductive	0	11.5	38.5
big brown bat	Female	Juvenile	non-reproductive	0	16.9	47.3
eastern red bat	Male	Adult	scrotal	0	13.3	40.7
eastern red bat	----	----	----	----	----	----
little brown bat	Male	Adult	non-reproductive	0	8.8	36.1
eastern red bat	----	----	----	----	----	----
eastern red bat	Male	Adult	scrotal	0	11.6	38.2
big brown bat	----	----	----	----	----	----
eastern red bat	Female	Juvenile	non-reproductive	0	9.3	35.8
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.3	35.4
hoary bat	Male	Juvenile	non-reproductive	0	22.0	56.0
northern long-eared bat	Female	Adult	post-lactating	0	7.6	36.6
eastern red bat	----	----	----	----	----	----
little brown bat	Male	Adult	scrotal	0	8.5	37.5
eastern red bat	Male	Adult	non-reproductive	0	13.8	38.6
northern long-eared bat	Male	Juvenile	non-reproductive	0	6.6	36.2

---- = escaped from net

Appendix E2. Details of bats captured at mist-net site EC-2; July 14 and 17, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 14						
eastern red bat	Female	Adult	non-reproductive	0	13.1	38.7
big brown bat	Female	Adult	post-lactating	0	22.3	48.5
big brown bat	Male	Adult	scrotal	0	17.5	45.4
northern long-eared bat	Female	Adult	post-lactating	0	8.5	35.8
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.3	35.2
big brown bat	Female	Adult	post-lactating	0	20.9	46.1
hoary bat	Female	Juvenile	non-reproductive	0	23.8	52.2
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.9	36.0
big brown bat	Female	Adult	post-lactating	0	22.2	51.4
northern long-eared bat	Male	Juvenile	non-reproductive	0	6.5	36.0
big brown bat	Male	Adult	scrotal	0	18.9	45.6
big brown bat	Female	Adult	lactating	0	20.9	46.6
northern long-eared bat	Male	Juvenile	non-reproductive	0	4.9	35.9
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.6	33.8
July 17						
big brown bat	Female	Adult	post-lactating	0	20.3	48.3
big brown bat	Female	Adult	post-lactating	0	20.5	48.0
big brown bat	Male	Adult	scrotal	0	17.3	44.9
big brown bat	Female	Adult	post-lactating	0	22.0	48.3
big brown bat	Female	Juvenile	non-reproductive	0	14.3	44.2
little brown bat	Female	Juvenile	non-reproductive	0	7.0	38.3
little brown bat	Female	Adult	post-lactating	0	8.5	37.5
hoary bat	Female	Juvenile	non-reproductive	0	27.3	57.0

Appendix E3. Details of bats captured at mist-net site EC-3; July 8 and 10, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 8						
eastern red bat	Male	Adult	non-reproductive	0	10.7	42.5
big brown bat	Male	Adult	non-reproductive	1	17.9	49.0
hoary bat	Male	Juvenile	non-reproductive	0	20.9	56.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	5.2	36.0
big brown bat	Female	Adult	post-lactating	0	18.6	49.0
big brown bat	Female	Adult	post-lactating	0	20.5	48.0
little brown bat	Male	Adult	non-reproductive	1	7.9	35.5
hoary bat	Male	Adult	non-reproductive	0	20.0	53.0
hoary bat	Male	Juvenile	non-reproductive	0	19.4	52.0
July 10						
eastern red bat	Female	Adult	post-lactating	1	13.4	42.0
little brown bat	Male	Adult	non-reproductive	0	6.9	36.0
big brown bat	Female	Juvenile	non-reproductive	0	13.1	47.0
big brown bat	Male	Adult	non-reproductive	0	16.4	43.5
big brown bat	Female	Adult	post-lactating	0	13.1	43.0
big brown bat	Female	Juvenile	non-reproductive	0	17.3	49.0
little brown bat	Male	Juvenile	non-reproductive	0	6.4	35.0
eastern red bat	Female	Adult	non-reproductive	0	13.5	40.0

Appendix E4. Details of bats captured at mist-net site EC-6; July 12 and 15, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 12						
eastern red bat	Female	Adult	non-reproductive	0	15.1	41.0
eastern red bat	----	----	----	----	----	----
little brown bat	Male	Adult	non-reproductive	0	7.5	37.0
eastern red bat	Male	Juvenile	non-reproductive	0	8.5	39.0
eastern red bat	Male	Adult	non-reproductive	0	10.5	37.0
big brown bat	Female	Adult	post-lactating	1	17.9	47.0
big brown bat	Female	Adult	post-lactating	0	19.8	48.0
big brown bat	Female	Adult	post-lactating	0	19.3	49.0
eastern red bat	Male	Adult	non-reproductive	0	11.3	40.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	5.5	34.0
big brown bat	Male	Juvenile	non-reproductive	1	13.2	45.0
big brown bat	Female	Adult	post-lactating	0	19.0	48.0
eastern red bat	Male	Adult	non-reproductive	0	12.3	42.0
little brown bat	Female	Adult	non-reproductive	0	8.4	37.0
little brown bat	Female	Adult	non-reproductive	0	8.1	36.0
northern long-eared bat	Female	Adult	post-lactating	0	7.1	36.0
hoary bat	Female	Juvenile	non-reproductive	0	22.7	56.0
eastern red bat	Female	Juvenile	non-reproductive	0	9.9	42.0
little brown bat	Female	Adult	non-reproductive	0	7.7	36.0
eastern red bat	Female	Adult	post-lactating	0	12.7	40.0
July 15						
hoary bat	Male	Adult	non-reproductive	0	22.8	56.0
big brown bat	Female	Adult	post-lactating	0	20.7	47.0
hoary bat	Female	Adult	post-lactating	0	27.8	56.0
hoary bat	Male	Juvenile	non-reproductive	0	22.1	54.0
big brown bat	Male	Adult	non-reproductive	0	18.3	48.0
big brown bat	Male	Adult	non-reproductive	0	17.0	47.0
eastern red bat	Male	Juvenile	non-reproductive	0	8.6	38.0
little brown bat	Male	Adult	non-reproductive	0	7.6	39.0
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.5	35.0
eastern red bat	Female	Adult	post-lactating	0	14.5	41.0
big brown bat	Male	Adult	non-reproductive	0	16.6	48.0
big brown bat	Male	Adult	non-reproductive	0	19.7	47.0
northern long-eared bat	Male	Juvenile	non-reproductive	0	6.4	35.0
hoary bat	Female	Juvenile	non-reproductive	0	24.4	56.0
big brown bat	Male	Juvenile	non-reproductive	1	14.1	45.0
big brown bat	Male	Adult	non-reproductive	0	18.9	44.0
big brown bat	Female	Adult	non-reproductive	0	19.9	49.0
hoary bat	Male	Juvenile	non-reproductive	0	22.9	54.0
eastern red bat	----	----	----	----	----	----
little brown bat	----	----	----	----	----	----
big brown bat	Female	Juvenile	non-reproductive	0	15.4	44.0
little brown bat	Female	Adult	post-lactating	0	8.1	37.0

---- = escaped from net

Appendix E5. Details of bats captured at mist-net site EC-7; July 13 and 16, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 13						
tricolored bat	Male	Juvenile	non-reproductive	0	5.0	33.0
big brown bat	----	----	----	----	----	----
big brown bat	Female	Adult	post-lactating	0	18.8	49.0
hoary bat	Male	Adult	non-reproductive	0	23.5	57.0
little brown bat	Female	Adult	non-reproductive	0	8.4	36.0
little brown bat	Female	Adult	post-lactating	0	9.1	38.0
little brown bat	----	----	----	----	----	----
July 16						
northern long-eared bat	Female	Adult	post-lactating	0	7.0	38.0
big brown bat	Female	Adult	non-reproductive	0	18.5	49.0
big brown bat	Female	Adult	post-lactating	1	16.5	47.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	5.1	37.0
eastern red bat	----	----	----	----	----	----
big brown bat	Male	Juvenile	non-reproductive	0	13.6	43.0
big brown bat	Female	Adult	non-reproductive	0	19.3	49.0

---- = escaped from net

Appendix E6. Details of bats captured at mist-net site EC-9; July 7 and 9, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 7						
big brown bat	Male	Adult	non-reproductive	1	17.3	47.0
northern long-eared bat	Female	Adult	post-lactating	0	6.6	36.0
eastern red bat	Female	Juvenile	non-reproductive	0	8.5	41.0
northern long-eared bat	Female	Adult	post-lactating	0	6.6	36.0
big brown bat	Male	Adult	non-reproductive	0	16.4	47.0
eastern red bat	Female	Adult	post-lactating	0	11.8	41.0
big brown bat	Female	Adult	post-lactating	0	18.4	48.0
big brown bat	Female	Adult	post-lactating	0	17.9	47.0
big brown bat	Male	Adult	non-reproductive	0	16.4	47.0
northern long-eared bat	Female	Adult	post-lactating	1	6.5	36.0
eastern red bat	Male	Juvenile	non-reproductive	0	8.1	38.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.6	35.0
northern long-eared bat	Female	Adult	post-lactating	0	7.1	37.0
northern long-eared bat	Female	Adult	post-lactating	0	6.8	36.0
northern long-eared bat	----	----	----	----	----	----
northern long-eared bat	Female	Adult	post-lactating	0	6.9	36.0
eastern red bat	Female	Juvenile	non-reproductive	0	9.0	41.0
big brown bat	Female	Juvenile	non-reproductive	0	13.6	47.0
big brown bat	Female	Adult	post-lactating	2	16.5	48.0
big brown bat	Male	Adult	non-reproductive	1	17.0	44.0
big brown bat	Male	Juvenile	non-reproductive	0	15.0	49.0
big brown bat	Male	Adult	non-reproductive	0	15.9	45.0
big brown bat	Female	Adult	non-reproductive	0	18.1	46.0
big brown bat	----	----	----	----	----	----
big brown bat	Male	Adult	non-reproductive	0	16.3	48.0
big brown bat	Female	Adult	post-lactating	0	19.4	48.0
big brown bat	Male	Adult	non-reproductive	1	16.5	45.0
big brown bat	Female	Juvenile	non-reproductive	1	14.1	47.0
big brown bat	Female	Adult	post-lactating	0	19.6	48.0
big brown bat	Male	Juvenile	non-reproductive	0	15.6	46.0
big brown bat	Male	Juvenile	non-reproductive	0	12.5	44.0
big brown bat	Female	Adult	post-lactating	1	19.5	46.0
big brown bat	Female	Adult	post-lactating	1	21.3	48.0
big brown bat	Female	Adult	post-lactating	1	20.3	48.0
big brown bat	Female	Juvenile	non-reproductive	1	14.5	49.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	5.7	36.0
northern long-eared bat	Female	Adult	post-lactating	0	6.8	36.0
northern long-eared bat	Female	Adult	post-lactating	0	7.0	36.0

Appendix E6. Details of bats captured at mist-net site EC-9; July 7 and 9, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 9						
eastern red bat	Female	Adult	post-lactating	0	12.4	42.0
big brown bat	Male	Adult	non-reproductive	0	15.4	45.0
big brown bat	Female	Adult	post-lactating	0	17.1	50.0
big brown bat	Female	Adult	post-lactating	1	18.3	49.0
big brown bat	Male	Adult	non-reproductive	0	16.4	45.0
big brown bat	Male	Adult	non-reproductive	0	15.5	46.0
big brown bat	Female	Adult	non-reproductive	0	17.5	47.0
northern long-eared bat	Female	Adult	post-lactating	1	6.7	36.0
big brown bat	Male	Juvenile	non-reproductive	0	9.1	42.0
northern long-eared bat	Male	Adult	non-reproductive	0	7.0	37.0
northern long-eared bat	Female	Adult	post-lactating	0	6.3	37.0
big brown bat	Male	Adult	non-reproductive	0	18.9	46.0
big brown bat	Female	Adult	post-lactating	0	18.7	49.0
big brown bat	Male	Juvenile	non-reproductive	0	13.9	45.0
big brown bat	Male	Adult	non-reproductive	0	17.3	46.0
big brown bat	Male	Adult	non-reproductive	0	19.0	45.0
big brown bat	----	----	----	----	----	----
big brown bat	Male	Juvenile	non-reproductive	0	13.0	45.0
big brown bat	Male	Juvenile	non-reproductive	0	12.3	45.0
northern long-eared bat	Female	Adult	post-lactating	0	7.4	36.0
eastern red bat	Male	Juvenile	non-reproductive	0	7.5	37.0
little brown bat	Female	Adult	post-lactating	0	9.4	39.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	5.9	35.0
big brown bat	Female	Juvenile	non-reproductive	0	18.1	49.0

---- = escaped from net

Appendix E7. Details of bats captured at mist-net site EC-10; July 8 and 10, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 8						
big brown bat	Male	Adult	non-reproductive	0	15.5	45.0
big brown bat	----	----	----	----	----	----
big brown bat	Female	Juvenile	non-reproductive	0	11.3	44.0
eastern red bat	Female	Juvenile	non-reproductive	0	7.9	39.0
little brown bat	Male	Adult	non-reproductive	0	8.3	38.0
big brown bat	Male	Adult	non-reproductive	0	14.9	45.0
big brown bat	Male	Juvenile	non-reproductive	0	14.8	46.0
big brown bat	Male	Juvenile	non-reproductive	0	14.9	45.0
July 10						
big brown bat	Female	Juvenile	non-reproductive	1	14.5	47.0
big brown bat	Female	Adult	post-lactating	0	18.5	49.0
big brown bat	----	----	----	----	----	----
eastern red bat	----	----	----	----	----	----
eastern red bat	Female	Adult	post-lactating	0	12.5	42.0
big brown bat	Female	Adult	post-lactating	0	17.4	50.0
big brown bat	Female	Juvenile	non-reproductive	0	13.4	49.0
big brown bat	Female	Adult	post-lactating	0	17.7	51.0
big brown bat	Female	Adult	post-lactating	0	18.4	49.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	5.5	35.0
hoary bat	Female	Adult	post-lactating	0	29.3	56.0

---- = escaped from net

Appendix E8. Details of bats captured at mist-net site EC-11; July 11 and 14, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 11						
eastern red bat	----	----	----	----	----	----
eastern red bat	Male	Juvenile	non-reproductive	0	8.8	39.0
northern long-eared bat	Female	Adult	post-lactating	0	7.9	37.0
big brown bat	Male	Adult	non-reproductive	0	17.3	48.0
big brown bat	Female	Adult	non-reproductive	1	19.8	48.0
eastern red bat	Female	Adult	non-reproductive	0	10.1	39.0
eastern red bat	----	----	----	----	----	----
eastern red bat	Male	Adult	non-reproductive	0	12.6	41.0
hoary bat	Male	Juvenile	non-reproductive	0	18.2	53.0
July 14						
northern long-eared bat	Female	Adult	post-lactating	0	6.2	36.0
big brown bat	Female	Adult	post-lactating	0	20.4	48.0
eastern red bat	Male	Adult	non-reproductive	0	12.9	40.0

---- = escaped from net

Appendix E9. Details of bats captured at mist-net site EC-12; July 6 and 8, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 6						
tricolored bat	Female	Adult	lactating	0	----	----
big brown bat	Female	Juvenile	non-reproductive	0	----	----
big brown bat	Male	Juvenile	non-reproductive	0	20.0	43.2
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.0	34.7
northern long-eared bat	Female	Adult	lactating	0	7.5	34.0
big brown bat	Male	Adult	scrotal	0	18.0	47.6
big brown bat	Female	Adult	lactating	0	20.0	47.1
eastern red bat	Female	Adult	lactating	0	12.0	40.3
big brown bat	Female	Adult	lactating	0	19.0	46.0
big brown bat	Female	Adult	lactating	0	21.0	45.7
little brown bat	Male	Adult	scrotal	0	7.0	36.1
big brown bat	Female	Adult	lactating	0	18.0	46.8
big brown bat	Male	Adult	scrotal	0	19.3	47.6
eastern red bat	Male	Juvenile	non-reproductive	0	7.5	38.5
eastern red bat	Male	----	----	----	----	----
July 8						
big brown bat	Male	Adult	scrotal	0	20.3	47.7
big brown bat	Male	Juvenile	non-reproductive	0	13.5	45.1
big brown bat	Male	Adult	scrotal	0	15.3	46.2
big brown bat	----	----	----	----	----	----
big brown bat	Female	Adult	lactating	0	18.0	46.6
big brown bat	Female	Adult	lactating	0	17.5	45.7
big brown bat	Female	Adult	lactating	0	18.8	47.4
big brown bat	Female	Adult	lactating	0	20.5	46.7
big brown bat	Male	Adult	scrotal	0	14.5	46.4
big brown bat	----	----	----	----	----	----
big brown bat	----	----	----	----	----	----
big brown bat	Female	Adult	lactating	0	24.3	46.5
big brown bat	----	----	----	----	----	----
big brown bat	----	----	----	----	----	----
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.8	36.2
big brown bat	Male	Adult	scrotal	0	19.0	49.5
big brown bat	Male	Adult	scrotal	0	16.0	43.5
big brown bat	Female	Juvenile	non-reproductive	0	17.0	46.0

---- = escaped from net

Appendix E10. Details of bats captured at mist-net site EC-13; July 6 and 8, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 6						
eastern red bat	Male	Adult	scrotal	0	10.0	38.0
big brown bat	Male	Juvenile	non-reproductive	0	15.3	47.8
big brown bat	Female	Adult	post-lactating	0	19.0	48.0
big brown bat	Female	Adult	lactating	0	19.3	48.1
big brown bat	Male	Juvenile	non-reproductive	0	16.0	43.5
big brown bat	Female	Juvenile	non-reproductive	0	10.0	41.8
hoary bat	Male	Juvenile	non-reproductive	0	19.5	53.0
big brown bat	Male	Adult	scrotal	0	16.1	47.1
big brown bat	Male	Juvenile	non-reproductive	0	13.8	46.5
big brown bat	Male	Adult	non-reproductive	0	16.8	45.1
big brown bat	Female	Juvenile	non-reproductive	0	17.0	48.0
eastern red bat	Female	Juvenile	non-reproductive	0	10.9	40.5
eastern red bat	Female	Juvenile	non-reproductive	0	12.0	40.2
northern long-eared bat	Male	Juvenile	non-reproductive	0	6.5	33.5
big brown bat	Female	Adult	post-lactating	0	23.5	49.3
big brown bat	Female	Juvenile	non-reproductive	0	16.3	48.2
little brown bat	Female	Adult	non-reproductive	0	9.0	39.3
big brown bat	Male	Adult	scrotal	0	17.3	44.0
July 8						
eastern red bat	----	----	----	----	----	----
big brown bat	Female	Adult	post-lactating	0	18.8	48.2
big brown bat	Male	Juvenile	non-reproductive	0	13.8	45.8
big brown bat	Male	Adult	scrotal	0	17.3	47.4
eastern red bat	Male	Juvenile	scrotal	0	9.3	39.8
hoary bat	Female	Juvenile	non-reproductive	0	22.8	58.1
big brown bat	Female	Juvenile	non-reproductive	0	14.3	46.5
eastern red bat	Female	Juvenile	non-reproductive	0	8.5	37.6
big brown bat	Female	Juvenile	non-reproductive	0	15.0	45.5
big brown bat	Male	Juvenile	non-reproductive	0	12.5	43.7
eastern red bat	----	----	----	----	----	----
big brown bat	Female	Adult	post-lactating	0	21.4	48.5
little brown bat	Female	Juvenile	non-reproductive	0	7.6	37.1
big brown bat	Male	Adult	scrotal	0	16.1	44.7
big brown bat	Female	Adult	post-lactating	0	21.3	48.1
eastern red bat	----	----	----	----	----	----
big brown bat	----	----	----	----	----	----

---- = escaped from net

Appendix E11. Details of bats captured at mist-net site EC-14; July 8 and 10, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 8						
eastern red bat	Female	Adult	lactating	1	16.5	44.0
big brown bat	Male	Juvenile	non-reproductive	0	15.0	46.0
big brown bat	Male	Adult	non-reproductive	0	16.5	47.0
little brown bat	Female	Adult	lactating	0	8.0	40.0
little brown bat	Male	Adult	non-reproductive	0	8.0	34.0
little brown bat	Male	Juvenile	non-reproductive	0	7.0	37.0
big brown bat	Female	Adult	lactating	0	15.5	46.0
big brown bat	Male	Juvenile	non-reproductive	0	12.5	44.0
eastern red bat	Male	Adult	scrotal	0	14.5	39.0
eastern red bat	Female	Adult	non-reproductive	0	18.0	40.0
big brown bat	Female	Juvenile	non-reproductive	0	15.0	44.0
big brown bat	Male	Juvenile	non-reproductive	0	14.0	49.0
eastern red bat	Male	Juvenile	non-reproductive	0	10.0	38.0
little brown bat	----	----	----	0	8.0	----
hoary bat	Female	Juvenile	non-reproductive	0	19.5	53.0
little brown bat	Female	Adult	non-reproductive	0	9.0	37.0
July 10						
big brown bat	Male	Juvenile	non-reproductive	0	15.0	49.0
eastern red bat	Female	Adult	non-reproductive	0	11.5	44.0
eastern red bat	Male	Adult	scrotal	0	11.5	40.0
northern long-eared bat	Female	Adult	lactating	0	7.0	35.0
eastern red bat	Male	Juvenile	non-reproductive	0	9.0	40.0

---- = escaped from net

Appendix E12. Details of bats captured at mist-net site EC-15; July 14 and 16, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 14						
eastern red bat	Male	Juvenile	non-reproductive	0	7.3	42.0
eastern red bat	Male	Adult	scrotal	0	12.0	41.0
big brown bat	Female	Juvenile	non-reproductive	0	12.5	45.0
big brown bat	Female	Adult	post-lactating	0	15.0	49.0
hoary bat	----	----	----	----	----	----
July 16						
little brown bat	Male	Juvenile	non-reproductive	0	6.0	40.0
little brown bat	Female	Adult	post-lactating	0	8.5	40.0
big brown bat	Female	Juvenile	non-reproductive	0	15.0	49.0
big brown bat	Female	Adult	post-lactating	0	21.0	50.0
big brown bat	Female	Adult	post-lactating	----	----	----
big brown bat	----	----	----	----	----	----
big brown bat	Male	Juvenile	non-reproductive	0	15.5	44.0
big brown bat	Male	Juvenile	non-reproductive	0	15.0	45.0
eastern red bat	Male	----	----	----	----	----
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.3	39.0

---- = escaped from net

Appendix E13. Details of bats captured at mist-net site EC-16; July 10, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 10						
big brown bat	Female	Adult	post-lactating	0	17.3	47.0
big brown bat	----	----	----	----	----	----
big brown bat	Female	Adult	post-lactating	0	18.8	47.0
big brown bat	Female	Adult	lactating	0	17.0	47.0
big brown bat	----	----	----	----	----	----
big brown bat	Male	Adult	scrotal	1	14.0	44.0
big brown bat	Female	Juvenile	non-reproductive	0	16.0	46.0
hoary bat	Male	Adult	non-reproductive	0	28.5	53.0
big brown bat	Male	Juvenile	non-reproductive	0	13.5	44.0
hoary bat	Male	Juvenile	non-reproductive	0	23.5	54.0
big brown bat	Male	Juvenile	non-reproductive	0	13.0	51.0
big brown bat	Female	Adult	lactating	0	17.5	46.0
big brown bat	Female	Adult	post-lactating	0	21.0	46.0
big brown bat	Female	Adult	lactating	0	19.3	48.0
big brown bat	Female	Juvenile	non-reproductive	0	13.5	46.0
big brown bat	----	----	----	----	----	----
big brown bat	Female	----	----	----	----	----
little brown bat	Female	Adult	post-lactating	0	6.5	38.0
eastern red bat	Female	Adult	post-lactating	0	13.0	44.0

---- = escaped from net

Appendix E14. Details of bats captured at mist-net site EC-17A; July 10 and 12, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 10						
eastern red bat	Female	Adult	non-reproductive	0	14.0	37.9
northern long-eared bat	Male	Juvenile	scrotal	0	6.0	34.6
northern long-eared bat	----	----	----	----	----	----
big brown bat	----	----	----	----	----	----
big brown bat	Female	Juvenile	non-reproductive	0	13.0	46.2
big brown bat	Male	Adult	scrotal	0	19.6	47.5
big brown bat	Female	Juvenile	non-reproductive	0	13.8	46.3
big brown bat	Female	Adult	post-lactating	0	16.6	47.1
big brown bat	Female	Juvenile	non-reproductive	0	13.8	46.8
big brown bat	Male	Adult	scrotal	0	17.5	44.5
big brown bat	Male	Adult	scrotal	0	17.2	46.3
big brown bat	Male	Adult	scrotal	0	15.6	44.4
big brown bat	Female	Juvenile	non-reproductive	0	17.0	44.0
big brown bat	Female	Adult	post-lactating	0	17.4	46.6
big brown bat	----	----	----	----	----	----
big brown bat	Male	Juvenile	non-reproductive	0	16.3	48.3
big brown bat	----	----	----	----	----	----
big brown bat	Female	Juvenile	non-reproductive	0	14.3	45.6
little brown bat	Female	Adult	post-lactating	0	7.8	37.0
July 12						
big brown bat	Male	Adult	scrotal	0	13.8	46.6
big brown bat	Male	Juvenile	non-reproductive	0	13.5	48.7
big brown bat	Female	Adult	post-lactating	0	20.1	48.0
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.8	34.1
big brown bat	Male	Juvenile	scrotal	0	13.3	44.4
big brown bat	Female	Juvenile	non-reproductive	0	12.6	46.8

---- = escaped from net

Appendix E15. Details of bats captured at mist-net site EC-17B; July 10 and 13, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 10						
big brown bat	Male	Adult	scrotal	0	14.4	43.8
big brown bat	----	----	----	----	----	----
big brown bat	Female	Adult	post-lactating	0	18.2	48
northern long-eared bat	Male	Juvenile	non-reproductive	0	6.5	36
big brown bat	Male	Adult	scrotal	0	15.6	44.3
big brown bat	Male	Adult	scrotal	0	14.1	44.1
northern long-eared bat	Male	Adult	scrotal	0	7.5	35.3
big brown bat	Female	Adult	post-lactating	0	19.9	45.7
northern long-eared bat	Male	Juvenile	non-reproductive	0	6.3	36.1
big brown bat	Male	Adult	scrotal	0	15.3	45.2
July 13						
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.4	36.0
big brown bat	Male	Adult	scrotal	0	17.0	46.0
big brown bat	Male	Juvenile	non-reproductive	0	16.1	45.2
big brown bat	Female	Adult	non-reproductive	0	19.8	47.0

---- = escaped from net

Appendix E16. Details of bats captured at mist-net site EC-18; July 15 and 17, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 15						
eastern red bat	Female	Adult	post-lactating	0	11.6	44.0
eastern red bat	Female	Juvenile	non-reproductive	0	9.9	42.0
big brown bat	Female	Adult	post-lactating	0	19.2	48.0
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.6	35.0
big brown bat	Female	Adult	non-reproductive	0	19.9	48.5
big brown bat	Female	Adult	post-lactating	1	17.4	46.0
big brown bat	Female	Adult	post-lactating	1	18.7	48.3
northern long-eared bat	Female	Juvenile	non-reproductive	0	5.0	37.1
big brown bat	Male	Adult	non-reproductive	0	16.6	46.0
big brown bat	Male	Juvenile	non-reproductive	0	13.9	45.0
big brown bat	Female	Adult	post-lactating	0	19.3	47.0
big brown bat	Male	Adult	scrotal	0	15.8	47.0
eastern red bat	Female	Adult	post-lactating	0	11.6	40.9
big brown bat	Female	Juvenile	non-reproductive	0	19.0	47.5
big brown bat	Male	Adult	non-reproductive	0	15.1	47.0
northern long-eared bat	Male	Adult	non-reproductive	0	6.5	34.9
big brown bat	Female	Adult	post-lactating	0	21.2	46.0
eastern red bat	Female	Adult	post-lactating	0	14.0	41.0
big brown bat	Male	Juvenile	non-reproductive	0	16.7	47.0
big brown bat	Female	Adult	post-lactating	0	21.1	48.0
big brown bat	Male	Juvenile	non-reproductive	0	16.6	47.1
big brown bat	Female	Adult	post-lactating	0	20.7	49.5
big brown bat	Female	Adult	post-lactating	0	20.4	46.5
big brown bat	Male	Adult	non-reproductive	0	17.1	47.0
big brown bat	Female	Adult	post-lactating	0	17.0	48.0
northern long-eared bat	Male	Adult	non-reproductive	0	7.1	34.0
big brown bat	Male	Juvenile	non-reproductive	0	13.1	46.0
northern long-eared bat	Female	Adult	post-lactating	0	6.5	35.0
big brown bat	Male	Adult	non-reproductive	0	18.5	46.0
eastern red bat	Female	Adult	post-lactating	0	9.5	38.7
northern long-eared bat	Female	Adult	post-lactating	0	7.5	38.0
big brown bat	Female	Juvenile	non-reproductive	0	16.1	46.5
eastern red bat	Female	Juvenile	non-reproductive	0	10.9	42.9
big brown bat	Female	Adult	lactating	0	20.3	47.1

Appendix E16. Details of bats captured at mist-net site EC-18; July 15 and 17, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 17						
eastern red bat	Male	Juvenile	non-reproductive	0	7.6	38.0
big brown bat	Male	Adult	non-reproductive	0	14.7	48.0
eastern red bat	Male	Adult	non-reproductive	0	9.9	38.0
eastern red bat	Female	Juvenile	non-reproductive	0	10.4	41.0
hoary bat	Female	Adult	post-lactating	0	24.5	52.0
big brown bat	Male	Juvenile	non-reproductive	0	15.5	44.9
big brown bat	Female	Adult	post-lactating	0	16.6	46.0
eastern red bat	Female	Juvenile	non-reproductive	0	9.6	41.0
big brown bat	Female	Adult	post-lactating	1	18.6	48.5
big brown bat	Female	Juvenile	non-reproductive	0	11.6	46.5
eastern red bat	Female	Juvenile	non-reproductive	0	11.7	41.0
big brown bat	Female	Juvenile	non-reproductive	0	15.9	48.1
eastern red bat	Female	Juvenile	non-reproductive	0	9.0	40.0
big brown bat	Female	Adult	post-lactating	0	19.0	49.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.5	37.3
northern long-eared bat	Female	Juvenile	non-reproductive	0	5.1	35.0
big brown bat	Female	Adult	post-lactating	0	20.6	46.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	5.0	36.3
big brown bat	Male	Adult	non-reproductive	0	15.2	44.9
big brown bat	Female	Adult	post-lactating	0	19.0	47.0
northern long-eared bat	Female	Adult	post-lactating	0	6.9	37.0
big brown bat	Male	Adult	non-reproductive	0	17.1	50.0
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.4	34.0
big brown bat	Female	Adult	post-lactating	0	21.3	46.0
big brown bat	Male	Juvenile	non-reproductive	0	16.5	47.0
eastern red bat	Male	Adult	non-reproductive	0	8.9	38.0
eastern red bat	Female	Adult	non-reproductive	0	11.1	44.0

---- = escaped from net

Appendix E17. Details of bats captured at mist-net site EC-19; July 15 and 17, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 15						
big brown bat	Female	Adult	lactating	0	18.5	43.0
northern long-eared bat	Female	Adult	lactating	0	6.5	34.0
northern long-eared bat	Female	Adult	lactating	0	8.0	34.0
July 17						
northern long-eared bat	Male	Adult	non-reproductive	0	7.5	35.0
big brown bat	Male	Adult	scrotal	0	17.5	44.0

---- = escaped from net

Appendix E18. Details of bats captured at mist-net site EC-20; July 12 and 14, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 12						
big brown bat	Female	Adult	post-lactating	0	16.0	44.8
big brown bat	Male	Adult	non-reproductive	0	14.6	47.1
big brown bat	Male	Juvenile	non-reproductive	0	11.9	40.0
big brown bat	Male	Adult	non-reproductive	0	17.1	46.9
big brown bat	Male	Juvenile	non-reproductive	0	13.5	46.5
big brown bat	Female	Adult	post-lactating	1	16.8	46.0
big brown bat	Female	Adult	post-lactating	1	17.0	45.0
big brown bat	Female	Adult	non-reproductive	0	13.5	44.1
big brown bat	Female	Adult	post-lactating	0	16.1	46.1
big brown bat	Female	Adult	post-lactating	0	18.4	45.0
big brown bat	Female	Juvenile	non-reproductive	0	15.0	47.0
big brown bat	Female	Adult	post-lactating	1	17.5	48.0
eastern red bat	Female	Juvenile	non-reproductive	0	10.0	39.5
big brown bat	Female	Adult	post-lactating	1	18.1	48.9
hoary bat	Female	Juvenile	non-reproductive	0	23.1	55.0
big brown bat	Male	Adult	non-reproductive	0	14.6	42.8
big brown bat	Female	Adult	post-lactating	0	16.4	46.9
big brown bat	Female	Adult	non-reproductive	0	17.3	44.9
big brown bat	Female	Adult	post-lactating	0	16.9	42.5
big brown bat	Female	Adult	post-lactating	1	19.9	46.0
big brown bat	Female	Adult	post-lactating	1	18.9	45.2
big brown bat	Female	Adult	post-lactating	1	18.4	49.0
big brown bat	Female	Adult	post-lactating	0	18.3	45.0
eastern red bat	Female	Juvenile	non-reproductive	0	7.9	40.0
big brown bat	Female	Adult	post-lactating	0	16.5	46.0
big brown bat	Male	Adult	non-reproductive	1	16.6	46.2
big brown bat	Female	Adult	post-lactating	1	17.3	45.1
big brown bat	Female	Juvenile	non-reproductive	1	15.0	47.9
big brown bat	Male	Adult	non-reproductive	0	17.5	46.0
big brown bat	Female	Adult	post-lactating	0	18.5	49.8
big brown bat	Female	Adult	post-lactating	0	21.0	47.0
big brown bat	Male	Adult	non-reproductive	1	17.7	46.8
big brown bat	Male	Adult	non-reproductive	0	18.9	46.6
big brown bat	Female	Adult	post-lactating	0	16.5	46.0
big brown bat	Male	Adult	non-reproductive	0	16.1	45.0
northern long-eared bat	Male	Juvenile	non-reproductive	0	6.5	33.0
big brown bat	Female	Adult	post-lactating	1	18.5	48.0
big brown bat	Female	Adult	post-lactating	0	20.1	50.0
big brown bat	Female	Adult	post-lactating	0	20.5	45.0
big brown bat	Male	Adult	non-reproductive	1	19.5	47.0
big brown bat	Female	Adult	post-lactating	0	19.6	48.0
big brown bat	Male	Adult	non-reproductive	0	15.0	44.0
big brown bat	Female	Juvenile	non-reproductive	0	15.2	48.0
big brown bat	Male	Juvenile	non-reproductive	0	14.6	43.0
big brown bat	Male	Adult	non-reproductive	0	19.7	45.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.1	35.5
northern long-eared bat	Male	Juvenile	non-reproductive	1	6.6	35.0
northern long-eared bat	Female	Adult	non-reproductive	0	6.3	39.0

Appendix E18. Details of bats captured at mist-net site EC-20; July 12 and 14, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
big brown bat	Female	Adult	post-lactating	0	17.9	46.0
big brown bat	Female	Adult	lactating	0	19.5	48.0
big brown bat	Male	Adult	non-reproductive	0	15.6	47.0
big brown bat	Male	Juvenile	non-reproductive	0	14.6	47.0
big brown bat	Female	Adult	post-lactating	0	19.6	49.8
big brown bat	Male	Adult	non-reproductive	0	15.4	45.0
big brown bat	Female	Juvenile	non-reproductive	0	13.9	46.0
big brown bat	Female	Adult	lactating	1	20.5	49.6
July 14						
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.4	36.0
eastern red bat	Male	Juvenile	non-reproductive	0	11.9	39.0
big brown bat	Male	Adult	non-reproductive	0	13.5	45.5
big brown bat	Female	Adult	post-lactating	0	19.1	45.5
big brown bat	Female	Adult	post-lactating	0	19.4	46.5
big brown bat	Female	Adult	post-lactating	1	19.5	46.5
big brown bat	Female	Adult	post-lactating	1	16.8	48.0
big brown bat	Female	Adult	post-lactating	1	17.1	46.0
big brown bat	Female	Juvenile	non-reproductive	0	16.2	49.0
eastern red bat	Female	Adult	post-lactating	0	14.2	40.0
big brown bat	Male	Adult	non-reproductive	2	13.5	45.0
big brown bat	Female	Adult	post-lactating	0	22.5	49.0
big brown bat	Female	Adult	post-lactating	0	19.9	49.9
eastern red bat	Male	Adult	non-reproductive	0	10.4	40.0
big brown bat	Male	Adult	non-reproductive	0	16.4	47.1
big brown bat	Female	Adult	post-lactating	0	19.0	46.0
big brown bat	Male	Adult	non-reproductive	0	18.8	47.5
big brown bat	Female	Adult	post-lactating	0	18.1	45.0
big brown bat	Male	Adult	non-reproductive	0	16.5	49.5
big brown bat	Female	Adult	post-lactating	0	17.0	48.9
big brown bat	Male	Adult	non-reproductive	0	16.6	46.0
big brown bat	Male	Adult	scrotal	0	18.4	47.2
big brown bat	Female	Adult	post-lactating	0	19.2	50.0
big brown bat	Female	Adult	post-lactating	1	19.4	49.1
big brown bat	Male	Adult	scrotal	0	15.5	47.1
northern long-eared bat	Female	Adult	post-lactating	1	7.6	35.5
big brown bat	Male	Adult	scrotal	0	15.0	45.1
big brown bat	Female	Adult	non-reproductive	0	20.4	47.0
big brown bat	Female	Adult	post-lactating	1	21.2	47.0
big brown bat	Female	Adult	non-reproductive	0	19.9	45.9
big brown bat	Female	Adult	post-lactating	0	20.1	46.0
eastern red bat	Female	Adult	post-lactating	0	16.7	42.0
northern long-eared bat	Male	Adult	non-reproductive	0	6.1	35.0

---- = escaped from net

Appendix E19. Details of bats captured at mist-net site EC-21; July 12 and 14, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 12						
big brown bat	Female	Adult	Lactating	0	18	46
northern long-eared bat	Female	Juvenile	non-reproductive	0	----	34
northern long-eared bat	Female	Adult	Lactating	0	6.5	34
northern long-eared bat	Male	Adult	non-reproductive	0	6	33
northern long-eared bat	Female	Adult	Lactating	0	7	36
northern long-eared bat	Male	Juvenile	non-reproductive	0	5	32
northern long-eared bat	Female	Adult	Lactating	0	7	35
northern long-eared bat	Female	Adult	Lactating	0	6.5	33
July 14						
northern long-eared bat	Female	Juvenile	non-reproductive	0	6	36
northern long-eared bat	Female	Adult	non-reproductive	0	6.5	34

---- = escaped from net

Appendix E20. Details of bats captured at mist-net site EC-22; July 26 and 28, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 26						
northern long-eared bat	Female	Juvenile	non-reproductive	0	8.0	36.5
big brown bat	Male	Juvenile	Scrotal	0	17.5	48.1
big brown bat	Female	Juvenile	non-reproductive	0	17.0	48.3
big brown bat	Male	Adult	scrotal	0	18.0	45.3
big brown bat	Female	Adult	post-lactating	0	19.5	48.7
big brown bat	Female	Adult	pregnant	0	24.5	49.0
eastern red bat	Female	Juvenile	non-reproductive	0	11.5	42.1
little brown bat	Female	Juvenile	non-reproductive	0	6.5	38.2
eastern red bat	Male	Juvenile	scrotal	0	11.0	41.3
northern long-eared bat	Male	Adult	scrotal	0	6.0	35.5
eastern red bat	Male	Juvenile	scrotal	0	10.5	41.5
little brown bat	Male	Adult	non-reproductive	0	8.5	36.5
eastern red bat	Male	Adult	scrotal	0	10.5	41.7
July 28						
eastern red bat	Female	Adult	non-reproductive	0	17.0	43.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	7.0	36.2
eastern red bat	Female	Juvenile	non-reproductive	0	10.0	43.8

---- = escaped from net

Appendix E21. Details of bats captured at mist-net site EC-23A; July 22 and 24, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 22						
eastern red bat	Female	Juvenile	non-reproductive	0	12.0	42.5
eastern red bat	Male	Juvenile	scrotal	0	10.0	41.0
big brown bat	Male	Adult	scrotal	0	19.0	48.5
big brown bat	Female	Adult	post-lactating	0	18.5	47.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.5	36.0
big brown bat	Male	Juvenile	scrotal	0	14.5	47.0
big brown bat	Female	Juvenile	non-reproductive	0	14.0	45.4
big brown bat	Female	Adult	post-lactating	0	20.5	48.9
little brown bat	Male	Adult	non-reproductive	0	8.5	36.5
big brown bat	Female	Adult	post-lactating	0	19.0	45.7
big brown bat	Female	Juvenile	non-reproductive	0	18.0	45.4
big brown bat	Male	Juvenile	non-reproductive	0	16.5	45.1
big brown bat	Female	Adult	post-lactating	0	21.0	48.0
big brown bat	Female	Adult	post-lactating	0	19.0	46.7
July 24						
eastern red bat	Female	Adult	non-reproductive	0	11.5	39.1
eastern red bat	Female	Adult	non-reproductive	0	13.0	40.3
eastern red bat	Female	Adult	non-reproductive	0	12.0	41.2

---- = escaped from net

Appendix E22. Details of bats captured at mist-net site EC-23B; July 22, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 22						
big brown bat	Female	Adult	post-lactating	0	18.0	48.7
big brown bat	Male	Adult	scrotal	0	16.0	48.4
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.0	36.0

---- = escaped from net

Appendix E23. Details of bats captured at mist-net site EC-26; July 23 and 25, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 23						
eastern red bat	Female	Adult	non-reproductive	0	10.5	41.0
big brown bat	Male	Adult	scrotal	0	16.0	45.0
northern long-eared bat	Female	Adult	post-lactating	0	6.0	35.0
big brown bat	Male	Adult	scrotal	0	17.0	47.5
big brown bat	Male	Juvenile	non-reproductive	0	16.0	41.8
big brown bat	Female	Adult	post-lactating	0	21.5	48.0
eastern red bat	Male	Juvenile	scrotal	0	12.0	41.0
big brown bat	Female	Adult	post-lactating	0	19.0	47.0
eastern red bat	Female	Juvenile	non-reproductive	0	10.0	39.5
northern long-eared bat	Male	Adult	scrotal	0	6.5	36.9
July 25						
little brown bat	Male	Adult	scrotal	0	8.0	37.1
big brown bat	Female	Adult	non-reproductive	1	18.0	46.4
big brown bat	Female	Adult	post-lactating	0	18.5	47.2
eastern red bat	----	----	----	----	----	----
big brown bat	Male	Juvenile	scrotal	0	16.0	46.0
northern long-eared bat	Female	Adult	post-lactating	0	8.0	36.4

---- = escaped from net

Appendix E24. Details of bats captured at mist-net site EC-27; July 18 and 20, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 18						
eastern red bat	Male	Juvenile	scrotal	0	9.5	39.8
eastern red bat	Male	Adult	scrotal	0	11.0	42.8
big brown bat	Male	Adult	scrotal	0	17.5	42.7
big brown bat	Female	Adult	lactating	0	18.5	46.2
big brown bat	Male	Adult	scrotal	0	21.0	47.6
big brown bat	Male	Juvenile	non-reproductive	0	15.0	45.3
big brown bat	Female	Adult	non-reproductive	0	19.0	48.2
northern long-eared bat	Female	Adult	post-lactating	0	7.0	35.8
eastern red bat	Female	Adult	post-lactating	0	14.0	41.0
northern long-eared bat	Female	Adult	post-lactating	0	7.5	36.8
big brown bat	Female	Adult	post-lactating	0	21.0	47.5
big brown bat	Female	Adult	post-lactating	0	19.5	48.0
big brown bat	Female	Adult	non-reproductive	0	20.0	49.7
big brown bat	Female	Adult	non-reproductive	0	12.0	46.7
northern long-eared bat	Female	Adult	post-lactating	0	7.0	35.9
July 20						
eastern red bat	Male	Juvenile	non-reproductive	0	12.0	38.0
big brown bat	Female	Adult	preg----nt	0	19.0	36.4
hoary bat	Female	Juvenile	non-reproductive	0	29.0	56.1
big brown bat	Female	Adult	post-lactating	0	19.0	47.0
eastern red bat	Female	Adult	preg----nt	0	19.5	44.5
eastern red bat	Male	Juvenile	scrotal	0	10.5	39.6
northern long-eared bat	Female	Adult	non-reproductive	0	6.0	35.2
big brown bat	Female	Juvenile	non-reproductive	0	16.0	47.0

---- = escaped from net

Appendix E25. Details of bats captured at mist-net site EC-28; July 25 and 27, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 25						
big brown bat	Female	Adult	pregnant	0	24.0	49.5
eastern red bat	Male	Juvenile	scrotal	0	8.0	37.8
eastern red bat	Male	Juvenile	scrotal	0	10.3	38.2
northern long-eared bat	Female	Adult	non-reproductive	0	8.0	38.5
eastern red bat	Male	Juvenile	scrotal	0	11.0	39.9
July 27						
eastern red bat	Female	Juvenile	non-reproductive	0	12.5	43.5
eastern red bat	Male	Adult	scrotal	0	9.5	38.6
northern long-eared bat	Male	Adult	non-reproductive	0	6.5	33.2
eastern red bat	Male	Juvenile	scrotal	0	9.5	38.0
eastern red bat	Male	Juvenile	scrotal	0	9.5	39.7
big brown bat	Female	Adult	pregnant	0	19.0	45.6
eastern red bat	Female	Juvenile	non-reproductive	0	10.5	40.2
eastern red bat	Female	Juvenile	non-reproductive	0	13.5	40.7
eastern red bat	Male	Juvenile	scrotal	0	8.5	39.8

---- = escaped from net

Appendix E26. Details of bats captured at mist-net site EC-29; July 26 and 29, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 26						
big brown bat	Male	Adult	scrotal	0	15.0	44.8
eastern red bat	Male	Adult	scrotal	0	11.5	40.6
July 29						
eastern red bat	Male	Adult	scrotal	0	10.5	41.8
northern long-eared bat	Female	Adult	non-reproductive	0	7.5	36.0
northern long-eared bat	Male	Adult	scrotal	0	7.0	36.3
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.5	37.1
northern long-eared bat	Male	Adult	non-reproductive	0	6.5	35.6
northern long-eared bat	Female	Adult	non-reproductive	0	7.0	36.4

---- = escaped from net

Appendix E27. Details of bats captured at mist-net site EC-30; July 11 and 13, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 11						
big brown bat	Male	Adult	non-reproductive	0	19.0	48.0
eastern red bat	Female	Juvenile	non-reproductive	0	10.0	40.0
eastern red bat	Female	Juvenile	non-reproductive	0	11.0	42.0
northern long-eared bat	Male	Adult	non-reproductive	0	6.0	36.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	7.0	37.0
big brown bat	Male	Adult	scrotal	0	16.0	49.0
big brown bat	Male	Adult	scrotal	0	17.0	44.0
July 13						
big brown bat	Female	Adult	post-lactating	0	22.0	46.2

---- = escaped from net

Appendix E28. Details of bats captured at mist-net site EC-32; July 9 and 11, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 9						
big brown bat	Male	Adult	non-reproductive	1	18.2	46.0
big brown bat	Male	Juvenile	non-reproductive	0	15.1	44.0
northern long-eared bat	Female	Adult	post-lactating	0	8.0	34.0
big brown bat	Male	Adult	non-reproductive	1	17.1	46.0
big brown bat	Male	Adult	non-reproductive	0	16.5	49.1
big brown bat	Male	Adult	non-reproductive	0	18.4	47.0
big brown bat	Male	Adult	non-reproductive	1	16.0	45.3
big brown bat	Female	Adult	lactating	1	22.4	50.0
July 11						
northern long-eared bat	Female	Adult	post-lactating	0	6.9	35.0

---- = escaped from net

Appendix E29. Details of bats captured at mist-net site EC-33; July 21 and 23, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 21						
big brown bat	Male	Juvenile	non-reproductive	0	13	45.7
big brown bat	Male	Adult	scrotal	0	15.5	44.5
big brown bat	Female	Adult	pregnant	0	20	47.6
big brown bat	Male	Juvenile	non-reproductive	0	15.5	45.7
big brown bat	Female	Adult	pregnant	0	21	49.3
July 23						
big brown bat	Female	Juvenile	non-reproductive	0	15.5	48.0
big brown bat	Female	Juvenile	non-reproductive	0	15.5	49.7
eastern red bat	Female	Juvenile	non-reproductive	0	11.0	46.0
northern long-eared bat	Female	Adult	lactating	0	8.5	38.4

---- = escaped from net

Appendix E30. Details of bats captured at mist-net site EC-34; July 9 and 11, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 9						
eastern red bat	Female	Adult	lactating	0	11.5	40.0
eastern red bat	Female	Adult	lactating	0	12.0	41.0
eastern red bat	Male	Juvenile	non-reproductive	0	9.5	41.0
eastern red bat	Female	Adult	lactating	0	13.5	43.0
big brown bat	Female	Adult	lactating	0	19.0	48.0
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.5	34.0
northern long-eared bat	Male	Juvenile	non-reproductive	0	7.0	36.0
July 11						
eastern red bat	Female	Adult	lactating	0	13.0	43.0
eastern red bat	Male	Adult	scrotal	0	10.0	38.0
big brown bat	Male	Adult	scrotal	0	15.5	45.0
northern long-eared bat	Female	Adult	lactating	0	6.5	33.0
northern long-eared bat	Male	Juvenile	non-reproductive	0	4.5	35.0
northern long-eared bat	Female	Adult	lactating	0	7.0	33.0

---- = escaped from net

Appendix E31. Details of bats captured at mist-net site EC-36; July 13, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 13						
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.0	35.0
hoary bat	Female	Adult	non-reproductive	0	26.0	56.0

---- = escaped from net

Appendix E32. Details of bats captured at mist-net site EC-37; July 11 and 13, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 11						
big brown bat	Female	Adult	lactating	0	17.0	45.3
big brown bat	Female	Adult	lactating	0	17.0	44.6
big brown bat	Female	Adult	lactating	0	16.0	45.1
big brown bat	Male	Juvenile	non-reproductive	0	12.0	45.2
big brown bat	Female	Adult	post-lactating	0	15.0	47.2
eastern red bat	Female	Juvenile	non-reproductive	0	9.0	40.2
big brown bat	Female	Juvenile	non-reproductive	0	10.0	42.0
big brown bat	Female	Adult	lactating	0	18.0	44.9
northern long-eared bat	Male	Adult	non-reproductive	0	8.0	33.6
northern long-eared bat	Male	Juvenile	non-reproductive	0	7.0	33.3
eastern red bat	Female	Juvenile	non-reproductive	0	11.0	40.9
big brown bat	Female	Adult	post-lactating	0	16.0	46.5
eastern red bat	Female	Adult	lactating	0	14.0	40.0
big brown bat	Male	Adult	scrotal	0	15.0	42.3
big brown bat	Female	Adult	lactating	0	17.0	46.0
eastern red bat	Male	Juvenile	non-reproductive	0	8.0	41.2
big brown bat	Female	Juvenile	non-reproductive	0	13.0	45.2
eastern red bat	----	----	----	----	----	----
big brown bat	Female	Adult	lactating	0	18.0	45.5
big brown bat	Female	Juvenile	non-reproductive	0	15.0	44.6
big brown bat	Female	Adult	post-lactating	0	21.0	46.7
eastern red bat	----	----	----	----	----	----
big brown bat	Male	Juvenile	non-reproductive	0	15.0	45.6
big brown bat	Male	Adult	non-reproductive	0	17.0	47.2
eastern red bat	Female	Juvenile	non-reproductive	0	8.0	40.1
eastern red bat	----	----	----	----	----	----
big brown bat	Male	Juvenile	non-reproductive	0	15.0	43.7
July 13						
big brown bat	Female	Adult	post-lactating	0	19.0	47.0
big brown bat	Female	Adult	post-lactating	0	20.0	49.0
big brown bat	Male	Adult	non-reproductive	0	15.0	42.0
big brown bat	Female	Adult	post-lactating	0	17.0	47.0
big brown bat	Male	Adult	non-reproductive	0	16.0	43.0
big brown bat	Female	Adult	post-lactating	0	18.0	45.0
big brown bat	Female	Adult	post-lactating	0	18.0	47.0
big brown bat	Female	Adult	post-lactating	0	20.0	45.0
big brown bat	Female	Adult	post-lactating	0	18.0	46.0
hoary bat	Male	Juvenile	non-reproductive	0	19.0	50.0
eastern red bat	Female	Adult	non-reproductive	0	16.0	41.0

---- = escaped from net

Appendix E33. Details of bats captured at mist-net site EC-38; July 7 and 9, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 7						
little brown bat	Female	Adult	lactating	0	7.0	35.9
little brown bat	Female	Adult	lactating	0	8.0	37.3
eastern red bat	Female	Adult	lactating	0	9.0	43.5
little brown bat	Female	Juvenile	non-reproductive	0	7.0	38.2
little brown bat	Female	Adult	lactating	0	7.0	37.8
little brown bat	Female	Juvenile	non-reproductive	0	7.0	37.5
northern long-eared bat	Female	Adult	lactating	0	6.0	37.2
little brown bat	Female	Adult	lactating	0	7.0	37.2
little brown bat	Female	Adult	lactating	0	8.0	37.7
little brown bat	Male	Juvenile	non-reproductive	0	6.0	36.4
little brown bat	Male	Juvenile	non-reproductive	0	5.0	35.6
little brown bat	Female	Adult	post-lactating	0	9.0	37.5
little brown bat	Female	Adult	lactating	0	7.0	36.4
northern long-eared bat	Female	Adult	non-reproductive	0	7.0	38.3
little brown bat	Female	Adult	lactating	0	7.0	37.0
little brown bat	Female	Adult	lactating	0	7.0	37.6
little brown bat	Male	Adult	non-reproductive	0	7.0	37.4
little brown bat	Female	Adult	lactating	0	8.0	37.2
little brown bat	Female	Adult	lactating	0	8.0	36.5
little brown bat	Male	Juvenile	non-reproductive	0	6.0	35.1
little brown bat	Female	Adult	lactating	0	7.0	37.3
little brown bat	Female	Adult	lactating	0	7.0	37.3
little brown bat	Female	Adult	lactating	0	5.0	36.7
little brown bat	Female	Juvenile	non-reproductive	0	7.0	37.4
little brown bat	Male	Juvenile	non-reproductive	0	7.0	37.7
little brown bat	Male	Adult	non-reproductive	0	6.0	36.9
little brown bat	Female	Adult	lactating	0	7.0	37.4
little brown bat	Female	Juvenile	non-reproductive	0	7.0	36.9
little brown bat	Male	Juvenile	non-reproductive	0	6.0	36.5
little brown bat	Female	Juvenile	non-reproductive	0	7.0	37.5
little brown bat	Female	Juvenile	non-reproductive	0	6.0	37.8
little brown bat	Male	Adult	non-reproductive	0	8.0	38.7
little brown bat	Female	Adult	lactating	0	8.0	37.0
little brown bat	Female	Adult	lactating	0	6.0	37.1
little brown bat	Female	Juvenile	non-reproductive	0	6.0	38.7
little brown bat	Female	Adult	lactating	0	8.0	37.3
little brown bat	Female	Adult	lactating	0	7.0	37.2
little brown bat	Female	Juvenile	non-reproductive	0	7.0	37.4
little brown bat	Female	Adult	lactating	0	6.0	36.8
big brown bat	Female	Adult	post-lactating	0	20.0	46.9
big brown bat	Female	Adult	post-lactating	0	19.0	47.0
little brown bat	Female	Adult	non-reproductive	0	7.0	36.7
big brown bat	Female	Adult	lactating	----	18.0	----
big brown bat	Male	Adult	non-reproductive	0	18.0	45.5
little brown bat	Male	Adult	non-reproductive	0	9.0	46.0
little brown bat	Female	Adult	lactating	0	8.0	36.2
little brown bat	Male	Adult	non-reproductive	0	8.0	37.2
hoary bat	Female	Juvenile	non-reproductive	0	19.0	52.7
eastern red bat	Female	Adult	post-lactating	0	17.0	43.7

Appendix E33. Details of bats captured at mist-net site EC-38; July 7 and 9, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
little brown bat	Male	Juvenile	non-reproductive	0	8.0	35.5
eastern red bat	Female	Juvenile	non-reproductive	0	12.0	41.5
little brown bat	Female	Juvenile	non-reproductive	0	7.0	36.5
little brown bat	Male	Juvenile	non-reproductive	0	6.0	35.8
little brown bat	Female	Juvenile	non-reproductive	0	7.0	37.8
July 9						
big brown bat	Female	Adult	post-lactating	0	15.0	47.3
little brown bat	Female	Adult	lactating	0	8.0	38.4
big brown bat	Female	Adult	post-lactating	0	21.0	45.6

---- = escaped from net

Appendix E34. Details of bats captured at mist-net site EC-39; July 7 and 9, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 7						
big brown bat	----	----	----	----	----	----
little brown bat	Female	Juvenile	non-reproductive	0	7.0	37.0
eastern red bat	Female	Adult	post-lactating	0	10.0	39.0
eastern red bat	Female	Adult	non-reproductive	0	12.0	40.0
big brown bat	Female	Adult	post-lactating	0	18.0	45.0
hoary bat	Male	Juvenile	non-reproductive	0	19.0	52.0
little brown bat	Male	Adult	non-reproductive	0	7.0	34.0
big brown bat	Male	Adult	non-reproductive	0	8.0	46.0
eastern red bat	Female	Juvenile	non-reproductive	0	7.0	39.0
big brown bat	Female	Adult	post-lactating	0	21.0	48.0
eastern red bat	Female	Juvenile	non-reproductive	0	11.0	39.0
big brown bat	Male	Adult	scrotal	0	18.0	46.0
eastern red bat	Male	Juvenile	non-reproductive	0	9.0	37.0
little brown bat	Male	Adult	non-reproductive	0	8.0	38.0
big brown bat	----	----	----	----	----	----
big brown bat	Male	Adult	scrotal	0	16.0	48.0
big brown bat	Female	Adult	post-lactating	0	20.0	49.0
big brown bat	Female	Juvenile	non-reproductive	0	17.0	48.0
eastern red bat	Female	Juvenile	non-reproductive	0	11.0	42.0
big brown bat	Female	Adult	post-lactating	0	19.0	44.0
big brown bat	Female	Adult	post-lactating	0	----	----
big brown bat	Male	Juvenile	non-reproductive	0	17.0	47.0
big brown bat	Female	Adult	post-lactating	0	23.0	49.0
July 9						
big brown bat	Female	Adult	post-lactating	0	20.0	47.0
eastern red bat	Female	Juvenile	non-reproductive	0	11.0	43.0
northern long-eared bat	----	----	----	----	----	----
big brown bat	Male	Adult	non-reproductive	0	19.0	44.0
eastern red bat	Female	Adult	post-lactating	0	9.0	39.0
big brown bat	Male	Adult	scrotal	0	19.0	49.0
big brown bat	Male	Juvenile	non-reproductive	0	16.0	49.0
big brown bat	Female	Adult	post-lactating	0	18.0	46.0
big brown bat	Female	Adult	post-lactating	0	21.0	50.0
big brown bat	Male	Juvenile	non-reproductive	0	17.0	46.0
big brown bat	Male	Adult	non-reproductive	1	16.0	45.0
little brown bat	Male	Juvenile	non-reproductive	0	7.0	37.0
eastern red bat	Male	Juvenile	non-reproductive	0	7.0	38.0
big brown bat	Female	Juvenile	non-reproductive	0	18.0	49.0
eastern red bat	Male	Adult	non-reproductive	0	10.0	40.0
big brown bat	Female	Juvenile	non-reproductive	0	18.0	45.0
hoary bat	Male	Adult	non-reproductive	0	22.0	54.0

---- = escaped from net

Appendix E35. Details of bats captured at mist-net site EC-40; July 2 and 8, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 2						
big brown bat	Female	Juvenile	non-reproductive	0	11.0	45.0
eastern red bat	----	----	----	----	----	----
big brown bat	Female	Juvenile	non-reproductive	0	14.0	44.0
big brown bat	Male	Juvenile	non-reproductive	0	14.0	45.0
big brown bat	Female	Juvenile	non-reproductive	0	12.0	44.0
big brown bat	Female	Juvenile	non-reproductive	0	16.0	48.0
big brown bat	Female	Adult	post-lactating	0	18.0	46.0
big brown bat	Male	Juvenile	non-reproductive	0	15.0	47.0
eastern red bat	Male	Juvenile	non-reproductive	0	8.0	38.0
eastern red bat	----	----	----	----	----	----
hoary bat	Male	Juvenile	non-reproductive	0	20.0	55.0
big brown bat	----	----	----	----	----	----
big brown bat	Female	Adult	lactating	0	20.0	49.0
big brown bat	Female	Juvenile	non-reproductive	0	17.0	49.0
July 8						
northern long-eared bat	Female	Adult	post-lactating	0	7.0	36.5
big brown bat	Male	Adult	scrotal	0	17.0	44.0
big brown bat	Female	Adult	post-lactating	0	19.0	47.0
big brown bat	Female	Adult	post-lactating	0	21.0	49.0
big brown bat	----	----	----	----	----	----
big brown bat	Male	Adult	scrotal	0	20.0	47.0
big brown bat	Male	Adult	scrotal	0	17.0	45.0
big brown bat	Female	----	----	----	18.0	----
big brown bat	----	----	----	----	----	----
big brown bat	Female	Adult	post-lactating	0	20.0	43.0
big brown bat	Male	Juvenile	non-reproductive	0	12.0	44.0
eastern red bat	Female	Juvenile	non-reproductive	0	9.0	40.0
big brown bat	Male	Adult	scrotal	----	----	----
big brown bat	Male	Juvenile	non-reproductive	0	11.0	34.0
big brown bat	Female	Adult	post-lactating	0	17.0	45.0
eastern red bat	Female	Juvenile	non-reproductive	0	10.0	42.0
big brown bat	Male	Juvenile	non-reproductive	0	14.0	46.0
big brown bat	Female	Adult	post-lactating	0	20.0	44.0
big brown bat	Female	Adult	post-lactating	0	18.0	48.0
hoary bat	Female	Adult	post-lactating	0	36.0	56.0

---- = escaped from net

Appendix E36. Details of bats captured at mist-net site EC-42; July 11 and 15, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 11						
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.3	34.0
northern long-eared bat	Male	Adult	non-reproductive	1	6.3	36.0
eastern red bat	Male	Adult	scrotal	0	11.8	37.0
eastern red bat	Male	----	----	----	----	----
northern long-eared bat	Female	Adult	post-lactating	0	7.3	36.0
July 15						
eastern red bat	Female	Juvenile	non-reproductive	0	9.0	38.0
big brown bat	Female	Juvenile	non-reproductive	0	13.3	44.0
hoary bat	Female	Juvenile	non-reproductive	1	9.0	45.0
hoary bat	Female	Juvenile	non-reproductive	0	7.8	45.0
little brown bat	Male	Adult	scrotal	0	8.8	38.0

---- = escaped from net

Appendix E37. Details of bats captured at mist-net site EC-44; July 25 and 27, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 25						
big brown bat	Female	Adult	non-reproductive	0	18.0	44.6
eastern red bat	Female	Juvenile	non-reproductive	0	11.0	41.0
big brown bat	Female	Adult	lactating	0	18.0	47.5
northern long-eared bat	Male	Juvenile	non-reproductive	0	6.0	36.5
July 27						
hoary bat	Male	Juvenile	scrotal	0	22.0	54.9

---- = escaped from net

Appendix E38. Details of bats captured at mist-net site EC-45; July 5 and 7, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 5						
big brown bat	Male	Adult	scrotal	0	16.3	47.9
big brown bat	Female	Juvenile	non-reproductive	0	10.0	42.6
big brown bat	Female	Adult	post-lactating	0	17.3	47.8
big brown bat	Female	Adult	post-lactating	0	19.9	49.0
big brown bat	Female	Adult	lactating	0	19.4	48.9
big brown bat	Female	Adult	post-lactating	0	15.8	46.6
big brown bat	Female	Adult	post-lactating	0	18.7	48.0
big brown bat	Female	Adult	post-lactating	0	18.2	47.3
big brown bat	Male	Juvenile	non-reproductive	0	15.9	47.7
big brown bat	Female	Adult	lactating	0	18.1	47.6
big brown bat	Female	Juvenile	non-reproductive	0	13.8	44.3
big brown bat	Male	Juvenile	non-reproductive	0	13.0	44.4
big brown bat	Female	Juvenile	non-reproductive	0	15.0	47.2
big brown bat	Female	Juvenile	non-reproductive	0	13.2	46.1
big brown bat	Female	Adult	post-lactating	0	23.0	48.7
big brown bat	Male	Juvenile	scrotal	0	14.7	44.4
big brown bat	Male	Juvenile	non-reproductive	0	14.4	47.3
eastern red bat	Female	Juvenile	non-reproductive	0	11.1	41.2
eastern red bat	Female	Juvenile	non-reproductive	0	11.3	43.2
big brown bat	Male	Adult	scrotal	0	20.6	48.0
big brown bat	Female	Adult	non-reproductive	0	20.7	47.2
big brown bat	Male	Juvenile	non-reproductive	0	11.2	44.0
big brown bat	Male	Juvenile	non-reproductive	0	12.4	42.5
eastern red bat	Male	Juvenile	scrotal	0	9.0	39.7
July 7						
eastern red bat	Male	Adult	scrotal	0	11.0	39.0
eastern red bat	Male	Adult	scrotal	0	7.8	39.1
big brown bat	Female	Adult	lactating	0	19.5	46.4
big brown bat	Male	Juvenile	non-reproductive	0	11.8	40.8
big brown bat	Male	Juvenile	non-reproductive	0	14.3	45.2
big brown bat	Male	Juvenile	non-reproductive	0	15.0	45.9
big brown bat	Male	Juvenile	scrotal	0	14.0	44.9
big brown bat	----	----	----	----	----	----
eastern red bat	Male	Juvenile	non-reproductive	0	10.3	40.8
big brown bat	----	----	----	----	----	----
big brown bat	Female	Adult	lactating	0	21.5	49.0
eastern red bat	Male	Juvenile	scrotal	0	10.0	39.4

---- = escaped from net

Appendix E39. Details of bats captured at mist-net site EC-46; July 5 and 7, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 5						
northern long-eared bat	Male	Juvenile	non-reproductive	0	6.0	35.0
big brown bat	Male	Adult	scrotal	0	20.0	45.2
northern long-eared bat	Female	Adult	lactating	0	8.5	37.0
eastern red bat	Male	Juvenile	non-reproductive	0	8.8	38.9
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.8	36.3
northern long-eared bat	Female	Adult	lactating	0	8.5	37.9
big brown bat	Female	Adult	lactating	0	20.8	47.0
July 7						
northern long-eared bat	Male	Adult	scrotal	0	6.3	35.5
big brown bat	Female	Adult	lactating	0	18.6	42.9
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.1	35.8
eastern red bat	Female	Juvenile	non-reproductive	0	10.0	38.7
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.8	35.9

---- = escaped from net

Appendix E40. Details of bats captured at mist-net site EC-47; July 6 and 10, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 6						
eastern red bat	Female	Adult	lactating	0	13.0	42.0
eastern red bat	Female	----	----	----	----	----
big brown bat	Male	Adult	non-reproductive	0	14.0	44.5
big brown bat	Female	Adult	post-lactating	0	17.0	45.0
big brown bat	Female	Adult	post-lactating	0	18.0	48.0
northern long-eared bat	Female	Adult	lactating	0	8.0	37.0
big brown bat	Female	Adult	post-lactating	0	19.0	47.0
big brown bat	Male	Adult	non-reproductive	0	18.0	46.0
big brown bat	Male	Adult	non-reproductive	0	15.0	45.0
big brown bat	Female	Adult	post-lactating	0	16.0	44.0
big brown bat	Female	Adult	post-lactating	0	21.0	49.0
big brown bat	Female	Juvenile	non-reproductive	0	15.0	45.0
eastern red bat	Female	Adult	non-reproductive	0	13.0	42.0
big brown bat	Female	Juvenile	non-reproductive	0	10.0	43.0
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.0	34.0
big brown bat	Male	Juvenile	non-reproductive	0	13.0	43.0
big brown bat	Female	Adult	post-lactating	0	22.0	49.0
big brown bat	Male	Adult	non-reproductive	0	17.0	46.0
big brown bat	Male	Juvenile	non-reproductive	0	16.0	45.0
big brown bat	Female	Adult	lactating	0	22.0	48.0
big brown bat	Male	Juvenile	non-reproductive	0	15.0	48.0
northern long-eared bat	Male	Adult	non-reproductive	0	6.0	35.0
northern long-eared bat	Female	Adult	post-lactating	0	5.0	36.0
big brown bat	Male	Juvenile	non-reproductive	0	15.0	46.0
big brown bat	Female	Adult	post-lactating	----	----	----
big brown bat	Male	Adult	non-reproductive	0	17.0	46.0
big brown bat	Male	----	----	----	----	----
northern long-eared bat	Female	Adult	non-reproductive	0	7.0	36.0
big brown bat	Female	Adult	post-lactating	0	21.0	47.0
eastern red bat	Female	Adult	post-lactating	0	13.0	39.0
big brown bat	Female	Adult	post-lactating	0	21.0	45.0
big brown bat	Female	Adult	non-reproductive	0	22.0	49.0
big brown bat	Male	Adult	non-reproductive	0	18.0	44.0
big brown bat	Male	Juvenile	non-reproductive	0	18.0	49.0
big brown bat	Male	Adult	non-reproductive	0	18.0	47.0
northern long-eared bat	Female	Adult	post-lactating	0	6.0	36.0
big brown bat	Female	Adult	post-lactating	0	19.0	46.0
July 10						
eastern red bat	Male	Juvenile	non-reproductive	0	8.0	39.0
eastern red bat	Female	Juvenile	non-reproductive	0	9.0	40.0
big brown bat	Female	Juvenile	non-reproductive	0	14.0	50.0
big brown bat	Female	Adult	post-lactating	0	17.0	47.0
big brown bat	Male	Juvenile	non-reproductive	0	11.0	44.0
big brown bat	Male	Adult	scrotal	0	18.0	45.0
big brown bat	Female	Juvenile	non-reproductive	0	14.0	47.0
big brown bat	Female	Juvenile	non-reproductive	0	13.0	46.0
big brown bat	Female	Juvenile	non-reproductive	0	14.0	49.0
big brown bat	Female	Adult	lactating	0	19.0	37.0
big brown bat	Male	Juvenile	non-reproductive	0	17.0	47.0

Appendix E40. Details of bats captured at mist-net site EC-47; July 6 and 10, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
big brown bat	Female	Juvenile	non-reproductive	0	13.0	44.0
hoary bat	Male	Juvenile	non-reproductive	0	23.0	55.0
northern long-eared bat	Male	Adult	non-reproductive	0	6.0	36.0
eastern red bat	----	----	----	----	----	----
big brown bat	Male	Adult	scrotal	0	16.0	47.0
northern long-eared bat	Female	Adult	lactating	0	9.0	36.0
big brown bat	Male	Juvenile	non-reproductive	0	15.0	46.0
eastern red bat	Male	Adult	non-reproductive	0	12.0	41.0
northern long-eared bat	Male	Adult	non-reproductive	0	6.0	35.0
northern long-eared bat	Female	Adult	post-lactating	0	8.0	35.0
northern long-eared bat	Female	Adult	post-lactating	0	9.0	36.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.0	36.0

---- = escaped from net

Appendix E41. Details of bats captured at mist-net site EC-48; July 8 and 12, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 8						
big brown bat	Female	Adult	post-lactating	0	15.0	47.2
northern long-eared bat	Female	Adult	non-reproductive	0	7.0	35.0
big brown bat	Female	Adult	----	0	----	----
big brown bat	Female	Adult	post-lactating	0	18.0	44.6
big brown bat	Male	Adult	non-reproductive	0	17.0	45.2
big brown bat	Female	Juvenile	non-reproductive	0	15.0	46.6
northern long-eared bat	Female	Adult	lactating	0	8.0	34.5
big brown bat	Male	Adult	non-reproductive	0	17.0	47.0
big brown bat	Female	Adult	post-lactating	0	19.0	46.5
eastern red bat	Male	Adult	scrotal	0	10.0	39.8
eastern red bat	Female	Juvenile	non-reproductive	0	11.0	41.9
big brown bat	Male	Adult	non-reproductive	0	17.0	45.6
big brown bat	Female	Adult	post-lactating	0	21.0	48.1
big brown bat	Female	Adult	post-lactating	0	21.0	47.5
big brown bat	Female	Juvenile	non-reproductive	0	13.0	43.3
big brown bat	Male	Juvenile	non-reproductive	0	14.0	45.4
northern long-eared bat	Female	Adult	lactating	0	8.0	35.3
big brown bat	Female	Adult	post-lactating	0	19.0	46.9
big brown bat	Female	Adult	non-reproductive	0	16.0	47.0
eastern red bat	Male	Adult	non-reproductive	0	11.0	37.6
northern long-eared bat	Male	Adult	non-reproductive	0	6.0	36.5
July 12						
big brown bat	Female	Adult	post-lactating	0	18.0	45.6
northern long-eared bat	Male	Adult	non-reproductive	0	7.0	33.7
big brown bat	Male	Adult	scrotal	0	17.0	44.7
big brown bat	Female	Juvenile	non-reproductive	0	14.0	45.4
big brown bat	Female	Adult	post-lactating	0	19.0	46.6
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.0	35.6
big brown bat	Male	Juvenile	non-reproductive	0	12.0	42.0
big brown bat	Male	Juvenile	non-reproductive	0	15.0	44.2
eastern red bat	Female	Adult	post-lactating	0	16.0	38.8
big brown bat	Female	Adult	post-lactating	0	18.0	45.1

---- = escaped from net

Appendix E42. Details of bats captured at mist-net site EC-49A; July 3 and 5, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 3						
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.0	34.0
northern long-eared bat	Female	Adult	lactating	0	7.0	35.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	5.0	39.0
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.0	35.0
eastern red bat	Male	Juvenile	non-reproductive	0	8.0	39.0
July 5						
northern long-eared bat	Female	Adult	lactating	0	7.5	35.0
big brown bat	Female	Adult	post-lactating	0	16.5	47.0
northern long-eared bat	Female	Adult	non-reproductive	0	6.5	38.0
big brown bat	Female	Adult	post-lactating	0	19.0	48.0
big brown bat	Male	Adult	scrotal	0	18.0	48.0
northern long-eared bat	Female	Adult	lactating	0	7.0	33.0
big brown bat	Male	Adult	scrotal	0	18.0	48.0
big brown bat	Male	Adult	non-reproductive	0	17.0	44.0
northern long-eared bat	Female	Adult	lactating	0	5.5	36.0
hoary bat	Male	Juvenile	non-reproductive	0	18.0	55.0
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.0	34.0
northern long-eared bat	Female	Adult	lactating	0	7.0	36.0
northern long-eared bat	Female	Adult	lactating	0	7.0	37.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.0	35.0

---- = escaped from net

Appendix E43. Details of bats captured at mist-net site EC-49B; July 4 and 6, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 4						
northern long-eared bat	Female	Adult	non-reproductive	0	8.0	35.0
eastern red bat	----	----	----	----	----	----
July 6						
big brown bat	Male	Adult	scrotal	0	16.0	48.0
big brown bat	Female	Juvenile	non-reproductive	0	14.0	46.4
eastern red bat	Female	Juvenile	non-reproductive	0	10.0	41.9
northern long-eared bat	Male	Juvenile	non-reproductive	0	6.0	36.3
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.0	35.6
big brown bat	Female	Adult	post-lactating	0	19.0	47.4

---- = escaped from net

Appendix E44. Details of bats captured at mist-net site EC-50A; July 3 and 5, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 3						
big brown bat	Female	Adult	post-lactating	0	17.5	46.0
big brown bat	Female	Adult	post-lactating	1	17.9	47.0
big brown bat	Female	Adult	post-lactating	1	15.9	45.0
big brown bat	Male	Adult	non-reproductive	0	10.3	46.0
big brown bat	Male	Adult	non-reproductive	0	15.3	46.0
big brown bat	Male	Juvenile	non-reproductive	0	11.4	43.0
big brown bat	Female	Adult	post-lactating	1	20.9	48.0
eastern red bat	Female	Adult	post-lactating	0	14.7	43.0
northern long-eared bat	Female	Adult	post-lactating	0	5.2	35.0
big brown bat	----	----	----	----	----	----
big brown bat	Female	Juvenile	non-reproductive	0	14.2	46.0
big brown bat	Male	Juvenile	non-reproductive	1	11.9	46.0
eastern red bat	Male	Adult	non-reproductive	0	8.6	41.0
July 5						
big brown bat	Female	Adult	post-lactating	1	17.9	46.0
eastern red bat	Male	Juvenile	non-reproductive	0	8.3	39.0
big brown bat	----	----	----	----	----	----
big brown bat	Female	Adult	post-lactating	0	17.9	48.0
big brown bat	Male	Adult	non-reproductive	0	17.8	47.0
big brown bat	Female	Adult	post-lactating	0	19.9	47.0
big brown bat	Male	Juvenile	non-reproductive	0	12.9	45.0
big brown bat	Female	Adult	post-lactating	0	19.1	47.0
big brown bat	Female	Adult	post-lactating	1	18.7	47.0
hoary bat	Female	Juvenile	non-reproductive	0	23.4	55.0

---- = escaped from net

Appendix E45. Details of bats captured at mist-net site EC-50B; July 4 and 6, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 4						
big brown bat	----	----	----	----	----	----
big brown bat	----	----	----	----	----	----
big brown bat	Female	Adult	post-lactating	1	17.1	46.0
big brown bat	Male	Adult	non-reproductive	0	16.1	47.0
big brown bat	Male	Juvenile	non-reproductive	0	11.6	45.0
evening bat	Female	Adult	post-lactating	0	11.9	37.0
northern long-eared bat	Female	Adult	post-lactating	0	7.6	37.0
big brown bat	Female	Adult	post-lactating	0	17.1	44.0
big brown bat	Female	Adult	post-lactating	1	21.2	49.0
eastern red bat	Female	Juvenile	non-reproductive	0	9.2	40.0
eastern red bat	----	----	----	----	----	----
big brown bat	Male	Juvenile	non-reproductive	0	11.5	45.0
big brown bat	Male	Juvenile	non-reproductive	0	9.1	42.0
big brown bat	Male	Adult	non-reproductive	0	16.1	44.0
big brown bat	Male	Juvenile	non-reproductive	1	15.1	47.0
big brown bat	Female	Adult	post-lactating	1	11.5	48.0
big brown bat	Male	Juvenile	non-reproductive	0	12.6	44.0
big brown bat	Male	Adult	non-reproductive	1	14.8	47.0
big brown bat	Female	Adult	post-lactating	1	19.2	46.0
July 6						
big brown bat	Female	Juvenile	non-reproductive	0	13.1	47.0
big brown bat	Female	Adult	post-lactating	0	16.8	45.0
big brown bat	Female	Juvenile	non-reproductive	0	13.3	47.0
northern long-eared bat	Female	Adult	post-lactating	0	6.9	37.0

---- = escaped from net

Appendix E46. Details of bats captured at mist-net site EC-51; July 18, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 18						
big brown bat	Female	Juvenile	non-reproductive	0	12	48

---- = escaped from net

Appendix E47. Details of bats captured at mist-net site EC-52; July 16, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 16						
northern long-eared bat	Male	Adult	scrotal	0	6.5	34.4
northern long-eared bat	Male	Juvenile	non-reproductive	0	6.5	35.9

---- = escaped from net

Appendix E48. Details of bats captured at mist-net site EC-53; July 13 and 16, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 13						
big brown bat	Male	Juvenile	non-reproductive	0	13.6	46.0
big brown bat	Male	Adult	non-reproductive	0	17.1	50.5
northern long-eared bat	Male	Juvenile	non-reproductive	0	5.8	37.0
big brown bat	Male	Juvenile	non-reproductive	0	14.1	47.0
big brown bat	Male	Adult	non-reproductive	0	15.6	44.0
big brown bat	Female	Adult	post-lactating	0	15.3	49.0
big brown bat	Male	Juvenile	non-reproductive	0	13.9	48.0
big brown bat	Female	Adult	post-lactating	1	19.5	49.0
big brown bat	Male	Adult	non-reproductive	0	15.5	46.0
eastern red bat	Female	Juvenile	non-reproductive	0	7.4	38.0
eastern red bat	Male	Adult	non-reproductive	0	12.7	38.0
hoary bat	Female	Adult	non-reproductive	0	31.0	57.0
July 16						
eastern red bat	Male	Juvenile	non-reproductive	0	10.4	38.0
big brown bat	Male	Adult	non-reproductive	0	17.7	46.0
big brown bat	Female	Adult	post-lactating	0	18.4	46.0
eastern red bat	Female	Juvenile	non-reproductive	0	13.9	41.1
eastern red bat	Male	Juvenile	non-reproductive	0	10.9	38.1

---- = escaped from net

Appendix E49. Details of bats captured at mist-net site EC-54; July 6 and 8, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 6						
eastern red bat	Female	Adult	post-lactating	0	12.0	42.0
northern long-eared bat	Female	Adult	lactating	0	6.8	36.0
northern long-eared bat	Male	Adult	scrotal	0	5.5	37.0
July 8						
northern long-eared bat	Male	Adult	non-reproductive	1	6.3	35.0

---- = escaped from net

Appendix E50. Details of bats captured at mist-net site EC-55; July 7 and 9, 2012.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
July 7						
big brown bat	Male	Adult	scrotal	0	17.5	47.0
northern long-eared bat	Female	Juvenile	non-reproductive	0	6.3	35.0
big brown bat	Male	Juvenile	non-reproductive	1	15.0	46.0
eastern red bat	Female	Adult	lactating	0	14.0	42.0
northern long-eared bat	Female	Adult	lactating	1	7.3	34.0
big brown bat	Female	Adult	lactating	0	20.0	45.0
big brown bat	Female	Adult	lactating	0	22.0	49.0
July 9						
eastern red bat	Female	Adult	post-lactating	----	----	----
big brown bat	Male	Adult	scrotal	0	17.0	47.0
big brown bat	Male	Adult	scrotal	0	18.0	48.0
big brown bat	----	----	----	----	----	----
big brown bat	Male	Juvenile	non-reproductive	1	14.0	46.0

---- = escaped from net

Appendix F. Mist-Net Survey Capture, Roost, and Weather Data Sheets (separate PDF)

Exhibit Y

Bat Mist-Netting Reports

5. Indiana Bat Mist Net Survey Report dated October 2011

Christine M.T. Pirik (0029759)
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Attorneys for Firelands Wind, LLC



**INDIANA BAT MIST NET SURVEY REPORT
FIRELANDS AND LYME WIND FARM PROJECT
ERIE, HURON, AND SENECA COUNTIES, OHIO**



Prepared for:

**Firelands Wind Farm, LLC and Lyme Wind Farm LLC
629 Euclid Avenue, Suite 635
Cleveland, Ohio 44114**

Submitted by:

**Tetra Tech EM, Inc.
250 West Court Street, Suite 200W
Cincinnati, Ohio 45202**

October 2011

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1.0 Introduction

This report describes the Indiana bat (*Myotis sodalis*) Mist Net Survey for the proposed Firelands and Lyme Wind Farm Project Area (Project Area). The Project Area is located in Erie, Huron, and Seneca Counties, Ohio (Appendix A - Figure 1).

The purpose of this pre-construction study was to provide data as to the presence/absence of the federally endangered Indiana bat, and bat species composition within the Project Area. This data will be used to assess the potential risk to bat species posed by the proposed wind project. The data gathered from the mist net survey, combined with an initial Indiana bat habitat assessment conducted in July 2011, will be used to further evaluate the potential need for an Incidental Take Permit (ITP) and Habitat Conservation Plan (HCP) for the Indiana bat.

The scope of work was performed in accordance with the Tetra Tech EM, Inc. (Tetra Tech) Task Order Proposals dated February 25, 2011 and March 25, 2011 for an Indiana Bat Mist Net Survey. All work was conducted in accordance with the *Indiana Bat Mist Netting Survey Plan* dated July 1, 2011, which was submitted to Ms. Angela Boyer of the United States Fish and Wildlife Service (USFWS) Columbus, Ohio Field Office. Authorization for the mist net survey was received from the USFWS in an electronic mail dated July 8, 2011 (Appendix B). Additionally, the mist net survey followed the Ohio Department of Natural Resources (ODNR) *On-shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in OH* (2009) and the survey recommendations outlined in correspondence received by Tetra Tech on May 21, 2011 from ODNR Wind Energy Lead, Jennifer Norris (Appendix B). Approval of the *Indiana Bat Mist Netting Survey Plan* dated July 1, 2011 from Jennifer Norris of ODNR was received on July 10, 2011 through an electronic mail (Appendix B). The survey was conducted under Redwing Ecological Services, Inc. (Redwing) federal permit #TE151107-0 and ODNR Wild Animal Permit #12-87 (Appendix C).

On behalf of Firelands Wind Farm, LLC and Lyme Wind Farm LLC (Firelands/Lyme), Tetra Tech EM, Inc. (Tetra Tech) and Redwing respectfully submit this Mist Net Survey Report for the federally and State of Ohio endangered Indiana bat within the proposed Project Area in Erie, Huron, and Seneca Counties, Ohio. This report includes a project description, Indiana bat background, methodologies used during the survey, results of the survey, and conclusions.

1.1 Project Description and Background

Firelands/Lyme is proposing to construct a wind energy facility across approximately 43,000 acres (Project Area) of primarily agricultural lands in Erie, Huron and Seneca Counties, Ohio. (Appendix A - Figure 1). The proposed facility will include the construction of approximately 85 turbines, or approximately 150 megawatts (mw) of installed wind capacity. Construction will be performed in two phases; the first phase is the Firelands Project and the second phase the Lyme Project (Appendix A - Figure 1). For the purposes of mist net survey, we considered both the Firelands Project and the Lyme Project together (Project Area). The Firelands/Lyme will also include development of infrastructure including transmission lines, substation facilities, and access roads, as necessary. The project is scheduled to begin construction in 2013.

The vast majority (over 98%) of the Project Area has been converted to cropland or other high intensity development. Forest stands and other natural habitats are generally small, scattered and highly fragmented. Of the approximately 43,000 acres within the Project Area, approximately 870 acres are considered potential Indiana bat summer roosting habitat (i.e. deciduous forest, scrub/shrub or forested wetlands).

Typical summer roosting habitat for the Indiana bat includes live or dead trees with exfoliating bark, cracks, crevices, or cavities located either on upland slopes, bottomlands, or along streams. This study focused primarily on the approximately 870 acres of potential Indiana bat summer roosting habitat within the Project Area.

Tetra Tech and Redwing professionals observed that most of the stream channels occurring within the Project Area have been extensively modified through agricultural practices. Six medium-sized creeks (Megginson Creek, Seymour Creek, Snyder's Ditch, Mills Creek, Pipe Creek, and Zorn Beutal Ditch) are found throughout the Project Area and typically drain to the northeast and east. No large rivers or water bodies occur within the Project Area. Scattered and fragmented forested, emergent, and scrub-shrub wetlands occur in the Project Area; however, most of these have been significantly disturbed by farming and draining activities.

The mist net survey focused on the approximately 870 acres of potential Indiana bat summer habitat (forest and scrub/shrub or forested wetlands) identified by Tetra Tech and Redwing within the proposed Project Area.

1.2 Indiana Bat Background

Species Status

The Indiana bat was listed as an endangered species on March 11, 1967, under the Endangered Species Preservation Act and is considered endangered throughout its range. Indiana bats often hibernate in large congregations and roost together during active periods in extended familial groups, leaving them as a species, very susceptible to human disturbance and vandalism. Commercialization of roosting caves, alteration of air flow or temperature within a roosting cave, pesticide contamination, and loss of summer roosting habitat are potential reasons for the species decline (NatureServe Website, 2011; USFWS, 2007).

Identification and Distribution

The Indiana bat is a medium sized, dull grayish brown *Myotis* found in the eastern United States. Adult species morphology is typified by forearm lengths ranging between 35 and 41 millimeters (mm) and a wingspan ranging between 240 and 267 mm (Barbour and Davis, 1969). Distinguishing characteristics of this species include a keeled calcar located along the membrane between the foot and tail, short toe hairs, pale nose, and short, narrow, pointed tragus of the ear (Barbour and Davis, 1969; Brown, 1997).

General Habitat and Species Information

The Indiana bat uses limestone caves for winter hibernation, preferably with a temperature between 37° Fahrenheit (F) and 43° F in midwinter and a relative humidity of 87 percent (USFWS website). In late April to early May Indiana bats emerge from the hibernacula and migrate to summer roost habitat consisting primarily of trees with loose bark, tree cavities, and hollow tree boles (Barbour and Davis, 1969; USFWS, 2007). During the summer the species feeds on moths, beetles, flies, and aquatic insects within riparian forests. The young are typically born in late June (Brown, 1997). In late August, Indiana bats begin to migrate to their winter caves (hibernacula) for hibernation. Indiana bats congregate and begin swarming activities near the caves as they prepare for mating in October and November (Barbour and Davis, 1969; Brown, 1997). The lifespan of the Indiana bat may exceed 20 years (Brown, 1997).

2.0 Methodology

The methodology for the mist net survey is described in the following sections:

2.1 Site Selection

Utilizing information gathered during a desktop review of USGS topographic maps, and aerial photographs, Redwing and Tetra Tech biologists conducted a site reconnaissance of the Project Area June 15 and 16, 2011. The purpose of the site reconnaissance was to identify suitable Indiana Bat habitat and determine potential mist site locations.

Nine mist net set site locations (MN) were identified within the proposed project area, along with one alternative site location chosen as a replacement, if needed. The *Indiana Bat Mist Netting Survey Plan* was submitted to the USFWS and the ODNR on July 1, 2011, for confirmation of methodologies and approval of mist net locations prior to the mist net survey. The nine sites were approved by Ms. Angela Boyer of the USFWS through an electronic mail (Appendix B) on July 8, 2011 as being sufficient to satisfy the amount of effort required by the *Indiana Bat (Myotis sodalis) Draft Recovery Plan* (USFWS, 2007). Additionally, Ms. Jennifer Norris of the ODNR approved the *Indiana Bat Mist Netting Survey Plan* through an electronic mail (Appendix B) on July 10, 2011, as being sufficient to satisfy the amount of effort required by the ODNR *On-shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in OH* (2009) to cover the Project Area and the ODNR survey recommendations outlined in correspondence received by Tetra Tech on May 21, 2011 from Ms. Norris (Appendix B).

Selection of mist net survey site locations involved evaluation of each of the major natural habitats and larger stream corridors within the Project Area (Appendix A – Figure 1). Photographs of the mist net sites are provided in Appendix D. The nine identified mist net survey sites include:

- **Site MN-1:** corridor located along a well-maintained access road on the western edge of a large pond in the northeast portion of the Firelands project area. The site was east of Kelly Road and north of Strecker Road, and was located between the Ohio Turnpike and railroad tracks. The corridor provided an optimum flyway for bats and net placement with the pond to the east and an agricultural field to the west. The access road had good canopy closure with potential roost trees located along it.
- **Site MN-2:** located near the intersection of Livengood Road and Higbee Road in the northeastern portion of the Firelands project area. The site was located over a perennial tributary to the Huron River. The stream was entrenched and flows along a mature woodlot. There were some areas of ponded water within the tributary.
- **Site MN-3:** located along an all-terrain vehicle (TV) trail within a mature woodlot in the southern portion of the Firelands project area. The site was located north of Meade Road adjacent to an unnamed creek. The ATV trail had a good

opening out of the woods into a field and there are a large number of shagbark hickories (*Carya ovata*) in the woodlot.

- **Site MN-4:** located over Seymour Creek in the southeast portion of the Firelands project area. The site was east of State Highway 99 and north of Section Line Road 117. Seymour Creek is approximately eight to ten feet wide with a small riparian corridor with flowing water. There were several good net sites located along the creek.
- **Site MN-5:** located over Seymour Creek downstream of Site MN-4 in the southeast portion of the Firelands project area. The site was west of Section Line Road 117. Seymour Creek is shallow and wide at this location and appeared to have a riparian corridor on both sides of the creek providing good mist net set locations within the stream corridor.
- **Site MN-6:** located near the northeastern boundary of the Firelands project area north of Bryan Road and east of Thomas Road. The site consisted of a young to medium-aged woodland adjacent to active railroad tracks. The woodland had an opening to a soybean field and an open area with potential wetland habitat providing suitable habitat for mist net placement.
- **Site MN-7:** located in the upper watershed of Megginson Creek in the southwestern portion of the Lyme project area. The site was located north of Seel Road and west of State Route 4. Megginson Creek had an entrenched channel with marginal canopy closure that flows through mature woodland.
- **Site MN-8:** located in the southern portion of the Firelands project area south of State Highway 113, and east of Yingling Road. The site consisted of edge habitat along a woodlot. There was an overgrown access road with overhung branches that provided suitable canopy closure for the mist net placement. The woodlot had old native field habitat (managed and maintained for pheasant and quail hunting) on the west side and an agriculture field on the south side.
- **Site MN-9:** located on Mills Creek in the western portion of the Firelands project area north of Strecker Road between State Route 269 and Bragg Road. Mills Creek was wide at this location with a riparian corridor and quality forested canopy coverage and closure. The water in the stream was slow moving creating pool conditions.

2.2 Survey Methodology

The mist net survey was conducted in accordance with the approved *Indiana Bat Mist Netting Survey Plan*, dated July 1, 2011 and the specifications found in the *Indiana Bat (*Myotis sodalis*) Draft Recovery Plan* (USFWS, 2007), the ODNR *On-shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in OH* (2009) and the ODNR project specific survey recommendations outlined in correspondence received by Tetra Tech on May 21, 2011 from Ms. Norris (Appendix B). The mist net survey was conducted on July 19 - 30, 2011, by Redwing and Tetra Tech

biologists. All procedures were overseen by Mr. Benjamin Deetsch who holds the appropriate federal/state of Indiana bat collection permits (included as Appendix C). Procedures required by the USFWS to help control the spread of White Nose Syndrome (WNS) were employed prior to and throughout the survey activities (USFWS, 2009).

Mist net set locations at each of the sites are described below and depicted on Figure 2 in Appendix A. Photographs of the mist net set-ups are provided in Appendix D. Each mist net set location consisted of four net sets. Three (3) net sets consisted of two standard mist nets stacked on top of one another, and one (1) high net set consisted of three standard mist nets stacked on top of one another, as required by the ODNR *On-shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in OH* (2009).

- **Site MN-1:** This site consisted of four net set locations placed within a cleared corridor adjacent to a large pond. Three net sets were placed across the gravel access road within the cleared corridor and one high net set was placed between and parallel to the edge of the pond and the gravel road.
- **Site MN-2:** This site consisted of four net set locations, including one high net set, placed over an entrenched perennial stream that flows adjacent to an isolated woodlot surrounded by agricultural fields. Because the stream was not located within a riparian corridor, canopy closure was minimal.
- **Site MN-3:** This site consisted of four net set locations placed within an open corridor (ATV trail) within an isolated mature woodlot surrounded by agricultural fields. Three net sets were placed within the woodlot where canopy closure was maximized. One high net set was placed at the northern end of the woodlot at an opening used by vehicles to enter the woodlot.
- **Site MN-4:** This site consisted of four net set locations, including one high net set, placed over Seymour Creek within an enclosed riparian corridor surrounded by agricultural fields. All four net sets were placed where canopy closure was maximized.
- **Site MN-5:** This site consisted of four net set locations, including one high net set, placed over Seymour Creek. Seymour Creek flows through a young woodlot that sits adjacent to an agriculture field with a small buffer of maintained lawn between the woodlot and field. Net sets were placed where canopy closure was maximized.
- **Site MN-6:** This site consisted of four net set locations placed within a medium aged woodlot surrounded by agricultural fields. Two net sets were placed over a small forested wetland, perpendicular to one another. One net set was placed along the edge of the woodlot at the opening of a moderately cleared vehicle corridor. One high net set was placed over the vehicle corridor within the woodlot.
- **Site MN-7:** This site consisted of four net set locations placed within a cleared access corridor over Megginson Creek. Megginson Creek flows through a mature woodlot. One high net set was placed over an access road adjacent and

parallel to Megginson Creek. Three net sets were placed over Megginson Creek. The stream channel was highly entrenched and available canopy closure was maximized.

- **Site MN-8:** This site consisted of four net set locations placed along the edge habitat of a medium-aged woodlot and a non-maintained field. Two net sets, including one high net set, were placed perpendicularly to the woodlot. One net set was placed parallel to the woodlot at a small abandoned opening for vehicles. One net set was placed perpendicularly along a fencerow that extended out from the woodlot.
- **Site MN-9:** This site consisted of three net set locations placed over Mills Creek within a riparian corridor. Three net sets over the creek were placed where canopy closure was maximized. A fourth high net set was placed perpendicular to riparian corridor into an open field.

The nine mist net set sites covered various habitats, including wooded riparian corridors along perennial streams, open flight corridors within woodlots, and edge habitat of woodlots and stream corridors. These locations represent the most suitable areas of Indiana bat summer habitat and the most likely locations to capture Indiana bats throughout the Project Area.

3.0 Survey Results

One-hundred and seventy-five (175) bats, representing six common species, were captured during the survey, and included the following: eastern big brown bat (*Eptesicus fuscus*), red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), little brown bat (*Myotis lucifugus*), northern bat (*Myotis septentrionalis*), and evening bat (*Nycticeius humeralis*). No federally endangered bats, including the Indiana bat, were captured during the survey. The mist net survey results are presented in the following table and Mist Net Survey Data Sheets are provided in Appendix E.

Mist Net Set Site	Scientific Name	Common Name	# of Individuals Captured	Survey Date
MN-1	<i>Eptesicus fuscus</i>	Big brown bat	6	7/19/2011
	<i>Lasiurus borealis</i>	Red bat	5	
	<i>Lasiurus cinereus</i>	Hoary bat	1	
	<i>Eptesicus fuscus</i>	Big brown bat	4	7/21/2011
	<i>Lasiurus borealis</i>	Red bat	1	
MN-2	<i>Eptesicus fuscus</i>	Big brown bat	14	7/19/2011
	<i>Lasiurus borealis</i>	Red bat	5	
	<i>Lasiurus cinereus</i>	Hoary bat	2	
	<i>Eptesicus fuscus</i>	Big brown bat	2	7/22/2011*
	<i>Lasiurus borealis</i>	Red bat	2	
	<i>Eptesicus fuscus</i>	Big brown bat	15	7/24/2011
	<i>Lasiurus borealis</i>	Red bat	6	
<i>Nycticeius humeralis</i>	Evening bat	1		
MN-3	<i>Eptesicus fuscus</i>	Big brown bat	2	7/20/2011
	<i>Eptesicus fuscus</i>	Big brown bat	5	7/22/2011*
	<i>Lasiurus borealis</i>	Red bat	1	
	<i>Myotis septentrionalis</i>	Northern bat	1	
	<i>Eptesicus fuscus</i>	Big brown bat	2	7/24/2011
<i>Lasiurus borealis</i>	Red bat	1		
MN-4	<i>Eptesicus fuscus</i>	Big brown bat	2	7/20/2011
	<i>Lasiurus borealis</i>	Red bat	3	
	<i>Myotis septentrionalis</i>	Northern bat	4	
	<i>Eptesicus fuscus</i>	Big brown bat	1	7/25/2011
	<i>Lasiurus borealis</i>	Red bat	2	
MN-5	<i>Eptesicus fuscus</i>	Big brown bat	1	7/26/2011
	<i>Lasiurus borealis</i>	Red bat	1	
	<i>Lasiurus borealis</i>	Red bat	2	7/28/2011

Mist Net Set Site	Scientific Name	Common Name	# of Individuals Captured	Survey Date
MN-6	<i>Eptesicus fuscus</i>	Big brown bat	2	7/21/2011
	<i>Lasiurus cinereus</i>	Hoary bat	1	
	<i>Eptesicus fuscus</i>	Big brown bat	3	7/25/2011
	<i>Lasiurus borealis</i>	Red bat	1	
	<i>Nycticeius humeralis</i>	Evening bat	1	
MN-7	<i>Eptesicus fuscus</i>	Big brown bat	24	7/27/2011
	<i>Lasiurus borealis</i>	Red bat	2	
	<i>Myotis lucifugus</i>	Little brown bat	3	
	<i>Myotis septentrionalis</i>	Northern bat	1	
	<i>Eptesicus fuscus</i>	Big brown bat	4	7/29/2011
	<i>Lasiurus borealis</i>	Red bat	1	
	<i>Myotis lucifugus</i>	Little brown bat	1	
	<i>Myotis septentrionalis</i>	Northern bat	3	
MN-8	<i>Eptesicus fuscus</i>	Big brown bat	2	7/26/2011
	<i>Lasiurus borealis</i>	Red bat	3	
	<i>Lasiurus cinereus</i>	Hoary bat	1	
	<i>Eptesicus fuscus</i>	Big brown bat	8	7/28/2011
	<i>Lasiurus borealis</i>	Red bat	3	
MN-9	<i>Lasiurus borealis</i>	Red bat	2	7/27/2011
	<i>Myotis lucifugus</i>	Little brown bat	1	
	<i>Myotis septentrionalis</i>	Northern bat	9	
	<i>Eptesicus fuscus</i>	Big brown bat	3	7/29/2011
	<i>Lasiurus borealis</i>	Red bat	2	
	<i>Myotis septentrionalis</i>	Northern bat	2	
			Total	175

*rainout

Temperature ranged between 66° and 92° F throughout the 10 nights of the survey. Wind speeds ranged from 0-10 mph throughout the majority of the survey. Cloud cover was heavy with a three-quarter to one-quarter moon occurring on most nights. Two nights (July 22 and 23, 2011) were repeated due to rain events occurring sometime during the five-hour mist net survey.

4.0 Conclusion

An Indiana bat mist net survey was performed by Redwing and Tetra Tech biologists at nine mist net survey locations (Appendix A – Figure 2) during the period from July 19 through July 30, 2011 for the proposed Firelands and Lyme Wind Farm Project Area in northern Erie, Huron, and Seneca Counties, Ohio (Appendix A – Figure 1).

The vast majority (over 98%) of the Project Area has been converted to cropland or other high intensity development. Forest stands and other natural habitats are generally small, scattered and highly fragmented. Of the approximately 43,000 acres within the proposed Project Area, approximately 870 acres are considered potential Indiana bat summer roosting habitat (i.e. deciduous forest, scrub/shrub or forested wetlands).

The nine mist net site locations utilized for the survey included the several different habitats identified within the 870 acres of the Project area identified as potential Indiana bat habitat: wooded riparian corridors along perennial streams, open flight corridors within woodlots and edge habitat of woodlots and stream corridors. These locations were representative of habitats across the Project Area, containing suitable summer habitat for the Indiana bat, and represent the most likely areas to capture Indiana bats throughout the site.

During the mist net survey 175 individuals of six bat species were captured, including the big brown bat, the little brown bat, the red bat, the northern bat, the hoary bat and the evening bat. No federally/state listed threatened/endangered bat species were captured during the survey, and specifically no Indiana bats were captured.

5.0 Literature Cited

- Barbour, R.W., and W.H. Davis. 1969. Bats of America. University Press of Kentucky, Lexington, Kentucky.
- Brown, L.N. 1997. A Guide to the Mammals of the Southeastern United States. The University of Tennessee Press, Knoxville, Tennessee.
- NatureServe. 2009. NatureServe Explorer Website. An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Myotis+sodalis>. (Accessed: August 17, 2011).
- Ohio Department of Natural Resources, 2009. On-shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio, an Addendum to the Ohio Department of Natural Resource's Voluntary Cooperative Agreement. May 4.
- U.S. Fish and Wildlife Service (USFWS) Website. USFWS Division of Endangered Species, Indiana Bat located at <http://www.fws.gov/endangered/i/a/saa08.html>. Accessed on May 24, 2006.
- U.S. Fish and Wildlife Service (USFWS). 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan (IBDRP): First Revision. U.S. Fish and Wildlife Service – Region 3, April.
- U.S. Fish and Wildlife Service (USFWS) Website. USFWS White-Nose Syndrome located at http://www.fws.gov/whitenosesyndrome/pdf/WNSIpageDecontaminationProtocol_073110.pdf. (Accessed on August 17, 2011).

Appendix A

FIGURES



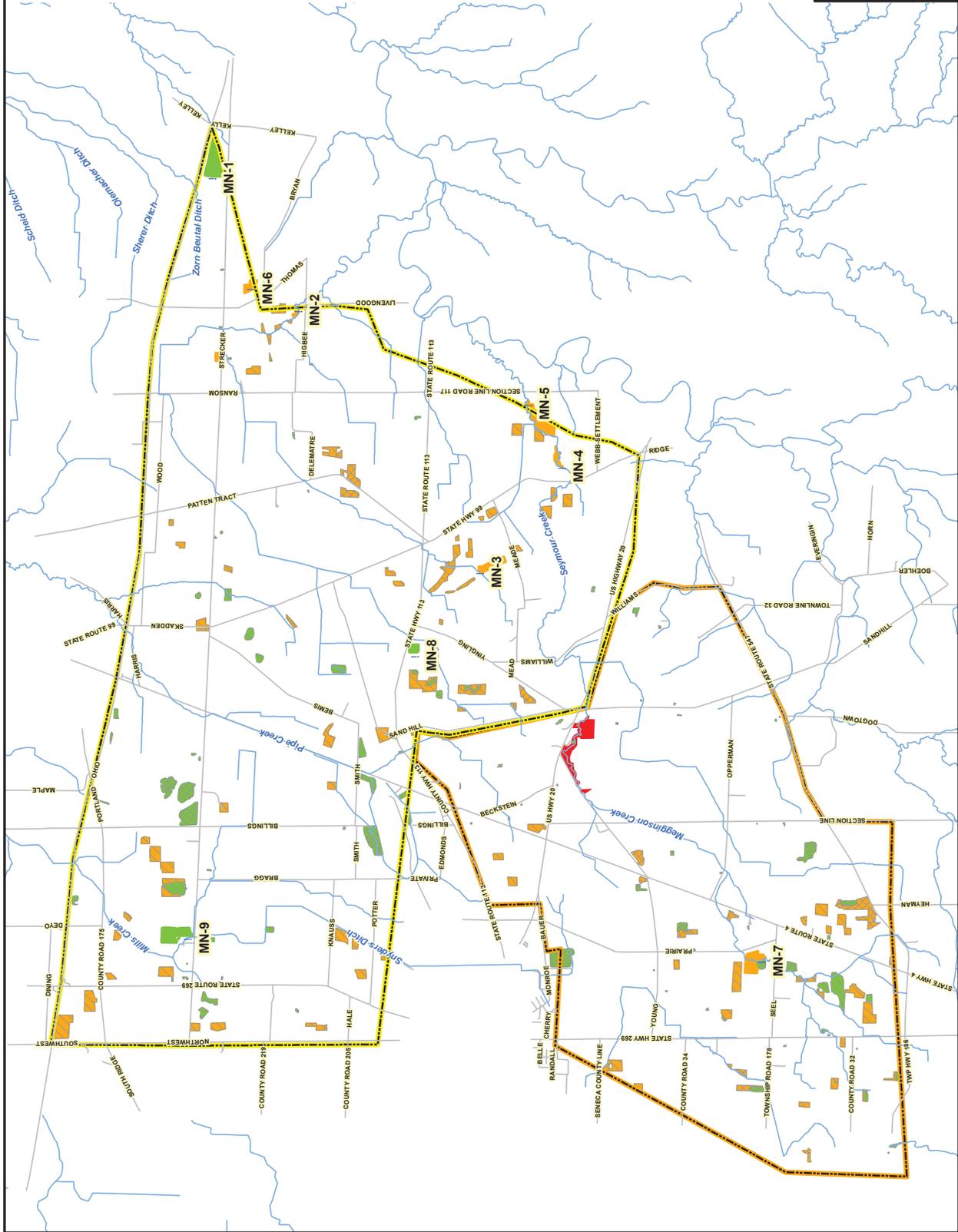
LEGEND

- Mist Net Location
- National Hydrography Dataset
- Roads
- Firelands Project Boundary
- Lyme Project Boundary
- Forested Habitat**
- Suitable Habitat
- Unsuitable Habitat/Net Location (On-Site Assessment)
- Unsuitable Habitat/Net Location (Vehicular Assessment)
- Forested Habitat No Access
- Wetland Habitat**
- Suitable Habitat
- Unsuitable Habitat/Net Location (On-Site Assessment)
- Unsuitable Habitat/Net Location (Vehicular Assessment)



FIRELANDS AND LYME
ERIE, HURON, AND SENECA COUNTIES, OHIO

FIGURE 1
MIST NET LOCATIONS



Appendix B

AGENCY AUTHORIZATION LETTERS

Benjamin Deetsch

From: Angela_Boyer@fws.gov
Sent: Friday, July 08, 2011 10:23 AM
To: Benjamin Deetsch
Cc: Melanie_Cota@fws.gov; greg.kern@tetrattech.com
Subject: Fw: Firelands/Lyme Indiana Bat Mist Netting Survey Plan
Attachments: pic03430.gif; pic31107.gif; WNSDecontaminationProtocol_January 25 2011.pdf; FINAL - I Bat Survey Plan-07012011-1100.pdf

Dear Redwing,

This is in response to a July 1, 2011 request for an amendment to your Federal Fish and Wildlife Permit No. TE151107-1 to conduct a 2011 mist net survey for the Indiana bat (*Myotis sodalis*) at the Firelands and Lyme Wind Energy Project site in Erie, Huron, and Seneca counties, Ohio.

This notification serves as written concurrence that Redwing Ecological Services is authorized to proceed with the Indiana bat survey as described in the request. Upon completion of the survey, we request that you submit an electronic copy of the survey results to this office for review. Please include the latitude and longitude coordinates for each survey site in the report. If any Indiana bats are found during the survey, please notify this office within 48 hours.

Due to concerns over White-nose Syndrome, **we are requiring that the White-nose Syndrome Decontamination Protocol be followed for all bat survey work conducted in Ohio.** Please be advised that the current protocol (attached) is subject to revision. Please visit the following link prior to conducting the survey to ensure the most current protocol is being followed.

<http://www.fws.gov/midwest/endangered/mammals/BatDisinfectionProtocol.html>

(See attached file: WNSDecontaminationProtocol_January 25 2011.pdf)

We request that all Indiana bats be banded utilizing the Ohio Department of Natural Resources, Division of Wildlife (DOW) bands. Please contact Jennifer Norris (DOW) to request bands @ (740) 747-2525, ext. 26.

Please carry a copy of this site specific authorization and your Federal permit while conducting the survey. Please contact me if you have questions, or we may be of further assistance in this matter.

Sincerely,
Angela Boyer
Endangered Species Coordinator for Ohio
U.S. Fish and Wildlife Service
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993, ext. 22
(614) 416-8994 FAX
angela_boyer@fws.gov

----- Forwarded by Angela Boyer/R3/FWS/DOI on 07/08/2011 10:14 AM -----

**Melanie
Cota/R3/FWS/DOI**

07/01/2011 12:50
PM

To "Kern, Greg" <Greg.Kern@tetrattech.com>, Angela
Boyer/R3/FWS/DOI

cc Benjamin Deetsch <bdeetsch@redwing.win.net>, "McIlvain,

Douglas" <Douglas.McIlvain@tetrattech.com>, "Endres, Peter" <Endres@juwi.com>, "Norris, Jennifer" <Jennifer.Norris@dnr.state.oh.us>, Kiersten Fuchs <kfuchs@redwing.win.net>, "Krivos, Matthew C." <Krivos@juwi.com>, "Megan_Seymour@fws.gov" <Megan_Seymour@fws.gov>, "Simons, Eric" <simons@juwi.com>

Subject: Re: Firelands/Lyme Indiana Bat Mist Netting Survey Plan

Greg,

All Indiana bat mist net survey protocols need to be sent to our endangered species coordinator, Angela Boyer for review and approval. I have copied her on this email.

Thanks! ~MC

Melanie Cota
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
4625 Morse Road, Suite 104
Columbus, OH 43230
614-416-8993 Ext. 15
614-416-8994 (Fax)
Melanie_Cota@fws.gov
<http://fws.gov/midwest/ohio>

Working with others to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

"Kern, Greg" <Greg.Kern@tetrattech.com>

"Kern, Greg"
<Greg.Kern@tetrattech.com>

07/01/2011 11:22 AM

To: "Norris, Jennifer" <Jennifer.Norris@dnr.state.oh.us>, "Melanie_Cota@fws.gov" <Melanie_Cota@fws.gov>, "Megan_Seymour@fws.gov" <Megan_Seymour@fws.gov>

cc: "McIlvain, Douglas" <Douglas.McIlvain@tetrattech.com>, Benjamin Deetsch <bdeetsch@redwing.win.net>, Kiersten Fuchs <kfuchs@redwing.win.net>, "Simons, Eric" <simons@juwi.com>, "Krivos, Matthew C." <Krivos@juwi.com>, "Endres, Peter" <Endres@juwi.com>

Subject: Firelands/Lyme Indiana Bat Mist Netting Survey Plan

Ms. Norris, Ms. Seymour, and Ms. Cota,

Please find attached our Indiana Bat Mist Net Survey Plan for your review and comment. If desired, I can coordinate a conference call with our team to answer your questions directly.

Time is of the essence so we cordially request that you review the attached plan at your earliest possible convenience. We intend to begin our mist netting event on July 19th, 2011.

Gregory M. Kern

Wind Energy Development Project Manager/Wildlife Biologist

TETRA TECH INC.

250 West Court Street, Suite 200W

Cincinnati, Ohio 45202

Office: (513) 564-8342

Cell: (513) 288-2213

Fax: (513) 241-0354

Email: greg.kern@tetratech.com

(See attached file: FINAL - I Bat Survey Plan-07012011-1100.pdf)

Kern, Greg

From: Norris, Jennifer [Jennifer.Norris@dnr.state.oh.us]
Sent: Sunday, July 10, 2011 3:43 PM
To: Kern, Greg
Subject: approved Firelands/Lyme Indiana Bat Mist Netting Survey Plan

Importance: High

Greg,

This email is in response to your July 1, 2011 email request for concurrence of the mist-netting survey plan for the Firelands/ Lyme Wind Energy Project site in Erie, Huron, and Seneca counties. The plan follows ODNR's 2009, *On-shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in OH*, provides the recommended effort of 9 netting sites, and the sites have been located in what appears to be sufficient habitat, therefore the plan is approved.

Upon completion of the survey, I request that you submit an electronic copy of the survey results to me for review. Please include the latitude and longitude coordinates for each survey site in the report. If any state-listed species (to include Indiana, Rafinesque's, and eastern small-footed bats) or larger numbers (>15 bats) of lactating females that are common colonial species are captured during the survey, please notify this office within 24 hours.

Please also remember that we are requiring strict adherence to the USFWS *White-nose Syndrome Decontamination Protocol* for all bat survey work conducted in Ohio. Please visit the following link prior to conducting the survey to ensure the most current protocol is being followed.

<http://www.fws.gov/midwest/endangered/mammals/BatDisinfectionProtocol.html>

As per Redwing's state permit and the 2009 protocol, all Indiana bats must be banded. Please contact me if Redwing (Ben Deetsch) needs bands.

Please contact me if you have questions, or we may be of further assistance in this matter.

Thanks, Jennifer

Jennifer L. Norris
Wildlife Research Biologist
Olentangy Wildlife Research Station
ODNR, Division of Wildlife
8589 Horseshoe Road
Ashley, OH 43003
Tel: 740 747-2525 Ext: 26
Cell: 419 602 3141
Email: jennifer.norris@dnr.state.oh.us

-----Original Message-----

From: Kern, Greg [<mailto:Greg.Kern@tetrattech.com>]

Sent: Friday, July 01, 2011 11:23 AM

To: Norris, Jennifer; Melanie_Cota@fws.gov; Megan_Seymour@fws.gov

Cc: McIlvain, Douglas; Benjamin Deetsch; Kiersten Fuchs; Simons, Eric; Krivos, Matthew C.; Endres, Peter

Subject: Firelands/Lyme Indiana Bat Mist Netting Survey Plan

Ms. Norris, Ms. Seymour, and Ms. Cota,

Please find attached our Indiana Bat Mist Net Survey Plan for your review and comment. If desired, I can coordinate a conference call with our team to answer your questions directly.

Time is of the essence so we cordially request that you review the attached plan at your earliest possible convenience. We intend to begin our mist netting event on July 19th, 2011.

Gregory M. Kern
Wind Energy Development Project Manager/Wildlife Biologist

TETRA TECH INC.
250 West Court Street, Suite 200W
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Office: (513) 564-8342
Cell: (513) 288-2213
Fax: (513) 241-0354
Email: greg.kern@tetratech.com



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

DAVID MUSTINE, DIRECTOR

Ohio Division of Wildlife

David B. Lane, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

May 21, 2011

To all interested parties,

Based upon the revised project boundary map received on April 28, 2011 and conference call on April 20, 2011 the Ohio Department of Natural Resources Division of Wildlife (DOW) has prepared these survey recommendations for juwi Wind's proposed combined Firelands-Lyme project located in Erie, Huron, and Seneca counties.

Currently the project falls within regions of the state that DOW has identified as needing moderate monitoring efforts. Recommendations are based on a GIS analysis of the site and may be reevaluated after a site visit. Additionally, if the developer decides to amend the current boundaries, the DOW will revise our survey recommendations.

The table below was created based upon a review of the project maps provided and summarizes the types and level of effort recommended by the DOW. Please note that monitoring and surveys should follow those criteria listed within the "On-shore Bird and Bat Pre-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio." Tetra Tech's proposed bald eagle nest monitoring methodology following the U.S. Fish and Wildlife Service's draft ECPG is approved for this site, however all other surveys should adhere to ODNR protocol.

Results from these studies will help the Department of Natural Resources assess the potential impact these turbines may pose, and influence our recommendations to the Ohio Power Siting Board.

For additional ODNR comments, including information on the potential presence of threatened and endangered species within or adjacent to your project area, please contact Brian Mitch at (614) 265-6378 or brian.mitch@dnr.state.oh.us

Project	
Survey type	
Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. If turbines are placed in agricultural land it, this requirement may be waived by DOW after a review of the proposed turbine locations is provided.
Raptor nest searches	Nest searches should occur on, and within a 1-mile buffer of the proposed facility.



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

DAVID MUSTINE, DIRECTOR

Raptor nest monitoring	There are 2 eagle nest located on or within the 2 miles of the proposed project. The pairs within the 2 mile radius should be monitored to assess their daily movement patterns. Should any additional nests of a protected species of raptor be located during nest searches, monitoring should commence as outlined within the on-shore protocols.
Bat acoustic monitoring	To be conducted at all meteorological towers.
Passerine migration (# of survey points)	4 (waived)
Diurnal bird/raptor migration (# of survey point)	1
Sandhill crane migration (same points as raptor migration)	NS
Owl playback survey points	NS
Barn owl surveys	NS
Bat mist-netting (# of survey points)	9
Nocturnal marsh bird survey points	NS
Waterfowl survey points	NS
Shorebird migration points	NS
Radar monitoring locations	NS

NS = Not required based on the lack of suitable habitat.

If you have any questions, please feel free to contact me.

Jennifer Norris, Wind Energy Wildlife Biologist
 Olentangy Wildlife Research Station
 Ohio Division of Wildlife
 8589 Horseshoe Road
 Ashley, OH 43003
 Office phone: 740-747-2525 x 26
 Cell: 419-602-3141
 Fax: 740-747-2278



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

DAVID MUSTINE, DIRECTOR

cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service
Mr. Brian Mitch, Ohio Department of Natural Resources



Ohio Department of Natural Resources

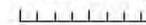
JOHN R. KASICH, GOVERNOR

DAVID MUSTINE, DIRECTOR

Figure 2. Forest cover with the boundary for juwi Wind's proposed and revised Firelands-Lyme project.



 juwi's Fireland-Lyme Project
 Forest cover

0 0.40.8 1.6 Miles




Appendix C

FEDERAL & STATE COLLECTION PERMITS



FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

REDWING ECOLOGICAL SERVICES, INC.
1139 S. FOURTH ST.
LOUISVILLE, KY 40203
U.S.A.

6. AUTHORITY-STATUTES-
16 USC 1538(a)

REGULATIONS-
50 CFR 17.32

50 CFR 13

3. NUMBER
TE151107-0

4. RENEWABLE
 YES
 NO

5. MAY COPY
 YES
 NO

6. EFFECTIVE
03/16/2010

7. EXPIRES
12/31/2011

8. NAME AND TITLE OF PRINCIPAL OFFICER (If not a business)

KIERSTEN R. FUCHS
SENIOR WILDLIFE BIOLOGIST

9. TYPE OF PERMIT

NATIVE ENDANGERED SP. RECOVERY - E WILDLIFE

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED

WITHIN THE STATES IDENTIFIED IN CONDITION F., AND IN ACCORDANCE WITH CONDITION G.

11. CONDITIONS AND AUTHORIZATIONS

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK 10 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

C.1. VALID FOR USE BY BENJAMIN DEETSCH. ASSISTANTS MAY WORK UNDER AUTHORIZATION OF THIS PERMIT UNDER THE DIRECT AND ON-SITE SUPERVISION OF NAMED PERMITTEE.

D. ACCEPTANCE OF THIS PERMIT SERVES AS EVIDENCE THAT THE PERMITTEE AND ITS AUTHORIZED AGENTS UNDERSTAND AND AGREE TO ABIDE BY THE TERMS OF THIS PERMIT AND ALL SECTIONS OF TITLE 50 CODE OF FEDERAL REGULATIONS, PARTS 13 AND 17, PERTINENT TO ISSUED PERMITS. SECTION 11 OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED, PROVIDES FOR CIVIL AND CRIMINAL PENALTIES FOR FAILURE TO COMPLY WITH PERMIT CONDITIONS. THIS PERMIT DOES NOT, EITHER DIRECTLY OR BY IMPLICATION, ALLOW OR GRANT RIGHT OF TRESPASS.

E. Permittee is authorized to take (capture, handle, radio-tag, and release) the Indiana bat (*Myotis sodalis*), gray bat (*M. grisescens*), Virginia big-eared bat (*Corynorhinus townsendii virginianus*), and Ozark big-eared bat (*C. t. ingens*) for scientific research aimed at recovery of the species: presence/absence surveys, studies to document habitat use, population monitoring, and evaluate potential impacts. This permit does not authorize the collection of voucher specimens.

F. Activities are authorized at the following locations:

F.1. Locations within Oklahoma (Region 2) upon receipt of written concurrence from Field Supervisor, as outlined in Condition G.

ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS

ANNUAL REPORT DUE: 1/31

ISSUED BY

TITLE

CHIEF - ENDANGERED SPECIES

DATE

03/16/2010

- F.2. Locations within Region 3 of the USFWS: Illinois, Indiana, Iowa, Michigan, Missouri, Ohio, and Wisconsin upon receipt of written concurrence from Field Supervisor, as outlined in Condition G.
- F.3. Locations within Region 4 of the USFWS: Alabama, Arkansas, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee upon written concurrence from Field Supervisor, as outlined in Condition G.
- F.4. Locations within Region 5 of the USFWS: Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia in accordance with required state permits.
- G. Permittee shall notify the USFWS Field Supervisor for the state in which activities are proposed to occur at least 15 days prior to conducting any activities. Contact information is Condition M., below. Your request must be in writing and must indicate:
- G.1. Location of proposed activities, including project site, county, and state.
- G.2. A description of the activities (i.e., surveys, radio-telemetry studies, etc.).
- G.3. Dates when the project is proposed to take place.
- G.4. Evidence that permittee has received any required contracts to complete the activities.
- G.5. You may proceed with activities only upon receipt of written concurrence from the applicable USFWS Field Supervisor. *Your concurrence letter must be carried with this permit to authorize locations not named in this permit.*
- H. The attached "Indiana Bat Mist-Netting Guidelines" shall be followed. Permittee shall also adhere to following conditions involving capture of bats:
- H.1. Bats shall be captured with mist nets. The monitoring interval for mist nets may not exceed 15 minutes. Captured bats should be held for a maximum of 30 minutes, unless injured. In extenuating circumstances, bats shall be held for no longer than 45 minutes.
- H.2. Permittees may carry out non-intrusive measurements on captured bats. Celluloid split-ring or lipped metal bands having unique identifier may be applied to the forearms of captured bats prior to release.
- H.3. Holohil Systems, or similar radio transmitters may be applied during summer roosting period via nontoxic skin bond adhesive such as colostomy glue. It is recommended that the total weight of the package (transmitter and adhesive) not exceed 5% of the bat's body weight. The lightest transmitters capable of accomplishing the required task should be used, especially with pregnant females and newly volant juveniles. Total weight of the package (transmitter and adhesive) is not to exceed 0.8 grams or 10% of the bat's body weight, whichever is less. Bats carrying transmitters must be monitored daily for at least three days, or until the transmitter falls off, whichever occurs first
- H.4. No trapping activities shall occur within 20 meters of an Indiana bat maternity roost site, either natural or artificial roosts, unless Permittee receives prior written approval from the U.S. Fish and Wildlife Service Field Supervisor for the state in which the activities are proposed to occur.
- H.5. Equipment used to capture and handle bats shall be cleaned and decontaminated according to the attached "Disinfection Protocol for Bat Field Studies." In addition, you are required to use the most recent handling protocols available by checking the protocols posted on the USFWS Midwest Region website at: <http://www.fws.gov/midwest/Endangered/mammals/BatDisinfectionProtocol.html>. You must visit the web site at least once every six weeks to determine whether new information has been learned regarding appropriate equipment handling to halt the spread of White Nose Syndrome in the bat community.
- I. Upon determination that endangered bats are present at previously undocumented sites, Permittee shall notify the following offices within 48 hours: the U.S. Fish and Wildlife Service Region 3 Office (Condition L.), and the U.S. Fish and Wildlife Service Field Office within the geographic location of study areas (Condition M.).
- J. Accidental mortality may not exceed two specimens. In the event that this number is met, all activities must cease. Any bat mortality or serious injury must be reported within 5 calendar days to the applicable office listed in condition M. and to the nearest U.S. Fish and Wildlife Service Law Enforcement Office (Attachment). Dead or moribund bats may be retained for further study only with the written permission of the U.S. Fish and Wildlife Service. Any bats that are not

authorized for retention are to be chilled and promptly transferred to the U.S. Fish and Wildlife Service for potential necropsy and/or contaminants analysis (Condition L.5.).

- K. Reports are due on January 31 following each year this permit is in effect. At a minimum, your report shall include:
- K.1. The date, time, locations (using UTM, latitude-longitude, section descriptors, or accurately plotted on USGS maps), age, sex, weight of all bats encountered.
 - K.2. Locations surveyed where no bats were encountered.
 - K.3. Band numbers of all bats banded.
 - K.4. Information on any injuries and/or mortalities and disposition of specimens.
 - K.5. Location and characteristics of roost trees and bat colonies.
 - K.6. Copies of any separate reports and/or publications resulting from work conducted under the authority of this permit.
 - K.7. A completed INDIANA BAT SURVEY AND BANDING DATA form.
 - K.8. Copies of all site-specific authorization letters required under condition G.
- L. Copies of your reports shall be sent to the offices listed below. When possible, electronic copies shall be submitted in lieu of hard copies in MS Word, Rich Text Format, Portable Document Format, or other file format that is compatible with the receiving office.
- L.1. Pete Fasbender
U.S. Fish and Wildlife Service
Ecological Services
1 Federal Drive
Fort Snelling, Minnesota 55111-4056
(612/713-5343; fax 612/713-5292)
permitsR3ES@fws.gov
 - L.2. David Dell
U.S. Fish and Wildlife Service
Attn: Permit Coordinator (AES/TE/P)
1875 Century Boulevard, Suite 200
Atlanta, Georgia 30345-3301
(404/679-7313; fax 404/679-7081)
permitsR4ES@fws.gov
 - L.3. Alex Hoar
U.S. Fish and Wildlife Service
Endangered Species Division
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589
(413/253-8631; fax 413/253-8482)
permitsR5ES@fws.gov
 - L.4. Marty Tuegel
Regional Recovery Permits Coordinator
U.S. Fish and Wildlife Service, Region 2
P.O. Box 1306
Albuquerque, New Mexico 87103-1306
(505/248-6654; fax 505/248-6788)
permitsR2ES@fws.gov

L.5. Lori Pruitt
Endangered Species Coordinator for Indiana
U.S. Fish and Wildlife Service
Ecological Services Field Office
620 S. Walker Street
Bloomington, Indiana 47403-2121
(812/334-4261 x1211; fax 812/334-4273)

M. Additionally, based on geographic area, reports and publications shall be submitted to the following:

M.1 For studies conducted in Illinois:

M.1.a. Jody Millar
Endangered Species Coordinator for Illinois/Iowa
U.S. Fish and Wildlife Service
Ecological Services Field Office
4469 48th Avenue Court
Rock Island, Illinois 61201
(309/793-5800, x524; fax 309/793-5804)

M.1.b. Endangered Species Coordinator
Illinois Department of Natural Resources
Division of Natural Heritage
Endangered and Threatened Species Program
Lincoln Tower Plaza
524 S. Second Street
Springfield, Illinois 62701-1787
(217/785-8290; fax 217/785-8277)

M.2. For studies conducted in Indiana:

Katie Gremillion-Smith
Endangered Species Coordinator
Indiana Department of Natural Resources
Division of Fish and Wildlife
Room W273, 402 W. Washington St.
Indianapolis, Indiana 46204-2267
(317/232-8160; fax 317/232-8150)

M.3. For studies conducted in Iowa:

M.3.a. Jody Millar
Endangered Species Coordinator for Illinois/Iowa
U.S. Fish and Wildlife Service
Ecological Services Field Office
1511 47th Ave.
Moline, Illinois 61265
(309/757-5800, x202; fax 309/757-5807)

M.3.b. Daryl Howell
Endangered Species Coordinator
Iowa Department of Natural Resources
Parks, Recreation, and Preserves
Wallace State Office Building
East 9th and Grand Avenue
Des Moines, Iowa 50319-0034
(515/281-8524)

M.4. For studies conducted in Michigan:

M.4.a. Jack Dingedine
Endangered Species Coordinator for Michigan
U.S. Fish and Wildlife Service
2651 Coolidge Road
East Lansing, Michigan 48823
(517/351-6320; fax 517/351-1443)

M.4.b. Christopher Hoving
Michigan Department of Natural Resources
Wildlife Division
5th Floor, Stevens T. Mason Bldg.
P.O. Box 30028
Lansing, Michigan 48909
(517/373-1263; fax 517/373-6705)

M.5. For studies conducted in Missouri:

M.5.a. Paul McKenzie
Endangered Species Coordinator for Missouri
U.S. Fish and Wildlife Service
Missouri Ecological Services Field Office
101 Park DeVille Drive, Suite A
Columbia, MO 65203-2132
(573/234-2132; fax 573/234-2181)

M.5.b. Stephanie Liebi
Scientific Collecting Permit Coordinator
Missouri Department of Conservation
Endangered Species and Natural History Division
2901 W. Truman Blvd.
P.O. Box 180
Jefferson City, Missouri 65102-0180
(573/751-4115 ext. 3574; fax 573/526-5582)

M.6. For studies conducted in Ohio:

O.6.a. Angela Boyer
Endangered Species Coordinator for Ohio
U.S. Fish and Wildlife Service
Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614/416-8993, x22; fax 614/416-8994)

M.6.b. Carolyn Caldwell
Endangered Species Coordinator
Ohio Department of Natural Resources
Division of Wildlife
2045 Morse Road
Building G
Columbus, OH 43229-6693
(614-265-6329)

M.7. For studies conducted in Wisconsin:

M.7.a. Cathy Carnes
Endangered Species Coordinator
U.S. Fish and Wildlife Service
Ecological Services Field Office
2661 Scott Tower Drive
New Franken, WI 54229
(920/866-1717 x1732; fax 920/866-1710)

M.7.b. Randle Jurewicz
Endangered Species Coordinator
Bureau of Endangered Resources
Box 7921
Madison, Wisconsin 53707-7921
(608/267-7507)

M.8. For studies conducted in Alabama:

Daphne Field Office
Bill Pearson, Field Supervisor
1208-B Main Street
Daphne, AL 36526
(251) 441-5181

M.9. For studies conducted in Arkansas:

Arkansas Field Office
Mark Sattelberg, Field Supervisor
110 South Amity
Suite 300
Conway, Arkansas 72032-8975
(501) 513-4470

M.10. For studies conducted in Georgia:

Georgia Field Office
Sandy Tucker, Field Supervisor
West Park Center
Suite D
105 West Park Drive
Athens, GA 30606-3175
(706) 613-9493

M.11. For studies conducted in Kentucky:

Frankfort Field Office
Lee Andrews, Field Supervisor
J C Watts Federal Bldg., Rm 265
330 West Broadway
Frankfort, KY 40601-8670
(502) 695-0468

M.12. For studies conducted in Mississippi:

Jackson Field Office
Ray Aycock, Field Supervisor
6578 Dogwood View Pkwy, Ste A
Jackson, MS 39213-7856
(601) 965-4900

M.13. For studies conducted in North Carolina:

Asheville Field Office
Brian Cole, State Supervisor
160 Zillicoa Street
Asheville, NC 28801-1082
(828) 258-3939

M.14. For studies conducted in South Carolina:

Charleston Field Office
Tim Hall, Field Supervisor
176 Croghan Spur Road, Suite 200
Charleston, SC 29407-7558
(843) 727-4707

M.15. For studies conducted in Tennessee:

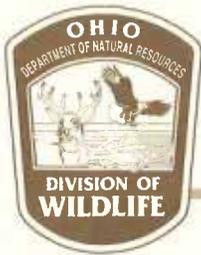
Cookeville Field Office
Mary Jennings, Field Supervisor
446 Neal Street
Cookeville, TN 38501-4027
(931) 528-6481

M.16. For studies conducted in Oklahoma:

Oklahoma Field Office
Dixie Birch, Field Supervisor
U.S. Fish and Wildlife Service
9014 E. 21st St.
Tulsa, Oklahoma 74129
(918) 581-7458

cc: FWS/Region 2, 4, 5, and 6 (AES/TE)
FWS, TE Coordinators for Illinois, Indiana, Iowa, Michigan, Missouri, Ohio, and Wisconsin
DNR/DOC, TE Coordinators for Illinois, Indiana, Iowa, Michigan, Missouri, Ohio, and Wisconsin

END



DIVISION OF WILDLIFE

Ohio Department of Natural Resources

Division of Wildlife Headquarters
2045 Morse Road, Bldg. G
Columbus, Ohio 43229-6693
1-800-WILDLIFE

WILD ANIMAL PERMIT: 12-87

SCIENTIFIC COLLECTION

Vicki J. Mountz

DATE ISSUED

Acting Chief, Division of Wildlife

2/8/2011

Others authorized on permit

YES (SEE ATTACHMENT)

BENJAMIN J. DEETSCH
REDWING ECOLOGICAL SERVICES, INC.
1139 S. FOURTH ST.
LOUISVILLE, KY 40203

SOCIAL SECURITY NUMBER: XXX-XX-2951

is hereby granted permission to take, possess, and transport at any time and in any manner specimens of wild animals, subject to the conditions and restrictions listed below or any documents accompanying this permit.

This permit, unless revoked earlier by the Chief, Division of Wildlife, is effective

from: 2/8/2011 to: 3/15/2012

This permit must be carried while collecting wild animals and be exhibited to any person on demand.

THIS PERMIT IS RESTRICTED TO THE FOLLOWING

1. Permittee may collect bats for survey and inventory purposes. No live endangered species may be held as voucher specimens. Dead specimens may be accessioned as voucher specimens to an approved facility.
2. The use of transmitters is approved to locate roost sites.
3. All voucher specimens are to be deposited at The OSU Museum of Biological Diversity or Cleveland Museum of Natural History.
4. Twenty-four hours prior to collecting activities, must make contact with the local wildlife officer or nearest wildlife district office to advise location(s) and duration of sampling.
5. All specimens are to be captured while utilizing protocols to prevent the spread of White Nose Syndrome (WNS) and must be released on-site within forty-five minutes of capture.
6. If Indiana bats are found or if WNS is suspected, contact DOW Bat Biologist Jennifer Norris at 740-747-2525 ext. 26 or mobile at 419-602-3141 within 24 hours.
7. 4. Collection is prohibited in Big Darby, Little Darby, Chagrin river and Fish Creek (Williams County) without explicit written permission from the Division of Wildlife.
8. Permittee must provide an annual report of collecting activities to the Division of Wildlife. Report shall provide species, quantity and locations of collection.

Locations of Collecting

STATEWIDE WITH NOTED EXCEPTIONS

Equipment and method used in collection:

MIST NETS, HARP TRAPS, SEINES, DIP NETS, HAND

Name and number of each species to be collected:

BATS INCLUDING INDIANA BATS (*Myotis sodalis*) FOR PRESENCE ABSENCE SURVEYS UNDER AUTHORITY OF VALID USFWS PERMIT TE151107 AND LETTER PERMIT FROM THE CHIEF OF THE DIVISION.

RESTRICTIVE DOCUMENTS ACCOMPANYING THIS PERMIT? NO

This permit is not valid for collecting migratory birds, their nests, or eggs unless a current permit from the U.S. Fish and Wildlife Service has been obtained.

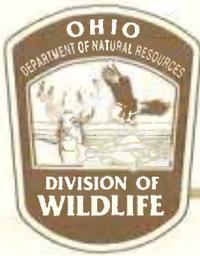
NO ENDANGERED SPECIES MAY BE TAKEN WITHOUT WRITTEN PERMISSION FROM THE CHIEF



ATTACHMENT

This attachment to Scientific Collecting Permit # 12-87 authorizes the following persons to conduct the activities listed on the permit, within the conditions and restrictions set forth. Each person must carry and exhibit upon request, a copy of the permit and this attachment when conducting any of the listed activities. The person named on the permit assumes full responsibility for the actions of the persons on this list and for completing and submitting all required reports.

<u>Name</u>	<u>SSN or Driver License</u>
KIERSTEN R. FUCHS	F97-942-686
NEIL A. GUTHALS	G91-050-387
L. MATTHEW BLAKE	B05-356-995
BRIAN J. O'NEILL	003-909-711
RICHARD S. CLAUSEN	C04-071-874
J. MICHAEL RICH	8925-03-7273
LINDSEY E. HESCH	H99-312-952
RICHARD FANGMAN	F03-962-724



DIVISION OF WILDLIFE

Ohio Department of Natural Resources

Division of Wildlife Headquarters
2045 Morse Road, Bldg. G
Columbus, Ohio 43229-6693
1-800-WILDLIFE

Vicki J. Mountz, Acting Chief

February 16, 2011

Benjamin J. Deetsch
Redwing Ecological Services, Inc.
1139 South Fourth St.
Louisville, KY 40203

Dear Mr. Deetsch:

This letter authorizes you, and those working under your supervision to work with Ohio bat species, including the Indiana bat (*Myotis sodalis*). By authority of the Endangered Species Act (ESA), you are hereby designated as an agent of the ODNR, Division of Wildlife (DOW) to conduct work on federally listed species of bats in Ohio. Your designation as an agent of DOW is effective beginning February 8, 2011 and will expire 15 March 2012. If necessary, you may request an extension of this designation to continue your work with federally listed species of bats in Ohio.

Effective until 15 March 2012, this designation allows you to (1) add dead Indiana bat and invertebrate specimens salvaged during field work to the OSU Museum of Biological Diversity's permanent collection, (2) monitor roost sites or survey suspected locations of federally listed species in Ohio, (3) locate additional roost or locations of federally listed species in Ohio, (4) set mist nets, utilizing current USFWS white nose syndrome (WNS) decontamination protocol in the vicinity of potential federally listed bat roost sites and determine use, (5) band federally listed bats in Ohio.

The United States Fish and Wildlife Service (USFWS) and DOW are partners in a cooperative agreement under Section 6c of the ESA. Your designation as an agent of the DOW means your work with federally listed species in Ohio is permitted under federal regulations 50 CFR 17.21c and 50 CFR 17.31b. This includes aid to sick, injured, or orphaned species [50 CFR 17.21c (3) (i)] and salvage of dead specimens useful for scientific study [50 CFR 17.21c (3) (iii)]. You must notify the USFWS of any such taking as outlined in 50 CFR 17.21c (4). In addition to salvage activities, you are authorized to take species of federally endangered species, as outlined in 50 CFR 17.21c (5), provided your activities meet the guidelines outlined in 50 CFR 17.21c (5) (i) - 50 CFR 17.21c (5) (iv).



Benjamin J. Deetsch

February 16, 2011

Page 2

A copy of 50 CFR 17 is attached to this letter for your review. In particular, please review 50 CFR 17.21 and 17.31. Note that a separate permit under Section 10 of the ESA is necessary in the case where you might hold live federally listed species longer than 45 days. Permit requests under Section 10 of the ESA should be directed to endangered species biologist Angela Boyer in Columbus, Ohio (614-416-8993 ext. 22). If you have questions about whether any proposed activities are covered under this authority or need any other assistance, contact the USFWS.

Information gathered from your work will be valuable to the DOW. A written report summarizing your findings should be provided to the following individuals; Jennifer Norris, at the Olentangy Wildlife Research Station, 8589 Horseshoe Rd., Ashley, OH 43003 and Angela Boyer, U.S. Fish and Wildlife Service, 4625 Morse Rd., Suite 104, Columbus, OH 43230. Annual reports are due by 15 March for the previous year.

Notify Jennifer Norris at (740) 747-2525 ext. 26 or mobile at (419) 602-3141 within 24 hours if an Indiana bat is found or if WNS is suspected on any bats observed. Please provide latitude and longitude coordinates or a thorough description of where the bat was observed.

Sincerely,

A handwritten signature in blue ink that reads "Vicki J. Mountz".

VICKI J. MOUNTZ
Acting Chief

VJM/mm

Enclosure

cc: C. Caldwell
J. Norris
A. Boyer, USFWS
file

Appendix D

PHOTOGRAPHS



Photograph 1: View of MN-1, Net Set 1. Net Set 1 was set across a gravel road within a cleared access corridor. Firelands and Lyme Wind Farm Project. July 19, 2011.



Photograph 2: View of MN-1, Net 2. Net Set 2 was a high net set south of Net Set 1 paralleling the edge of the pond and the access corridor. Firelands and Lyme Wind Farm Project. July 19, 2011.



Photograph 3: View of MN-1, Net Set 3. Net Set 3 was located just south of Net Set 2 and was set across the access road within the wooded corridor. Firelands and Lyme Wind Farm Project. July 19, 2011.



Photograph 4: View of MN-1, Net Set 4. Net Set 4 was located south of Net Set 3 across the access road within the wooded corridor. Firelands and Lyme Wind Farm Project. July 19, 2011.



Photograph 5: View of MN-2, Net Set 1. Net Set 1 was a high net set across a tributary to the Huron River. Firelands and Lyme Wind Farm Project. July 19, 2011.



Photograph 6: View of MN-2, Net Set 2. Net Set 2 was set downstream of Net Set 1 across the same stream. Firelands and Lyme Wind Farm Project. July 19, 2011.



Photograph 7: View of MN-2, Net Set 3. Net Set 3 was set downstream of Net Set 2 in the same entrenched, perennial stream. Firelands and Lyme Wind Farm Project. July 19, 2011.



Photograph 8: View of MN-2, Net Set 4. Net Set 4 was set downstream of Net Set 3. The stream is bordered by agricultural fields and a mature woodlot. Firelands and Lyme Wind Farm Project. July 19, 2011.



Photograph 9: View of MN-3, Net Set 1. Net Set 1 was set across a cleared corridor (ATV trail) within a woodlot surrounded by agricultural fields. Firelands and Lyme Wind Farm Project. July 20, 2011.



Photograph 10: View of MN-3, Net Set 2. Net Set 2 was set just north of Net Set 1 over the same corridor within the same woodlot. Firelands and Lyme Wind Farm Project. July 20, 2011.



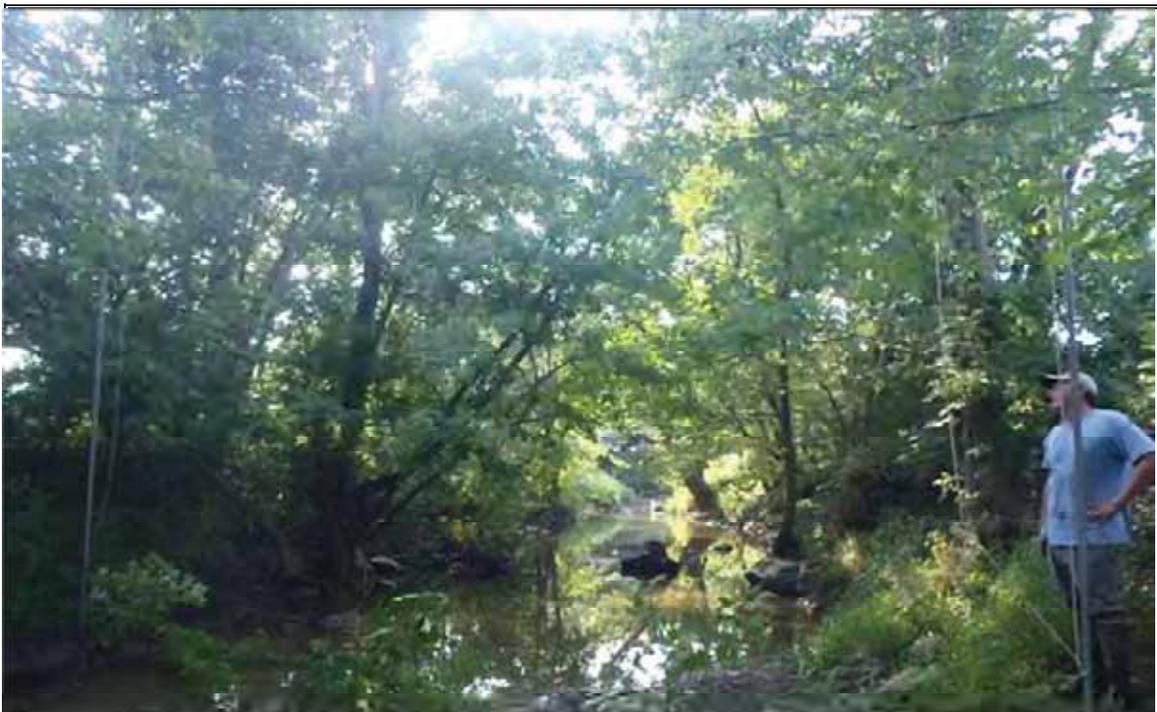
Photograph 11: View of MN-3, Net Set 3. Net Set 3 was set north of Net Set 2 within the same corridor. Firelands and Lyme Wind Farm Project. July 20, 2011.



Photograph 12: View of MN-3, Net Set 3B. A tree fell (seen in background) during a storm causing Net Set 3 to be reset north of the original Net Set 3. Firelands and Lyme Wind Farm Project. July 22, 2011.



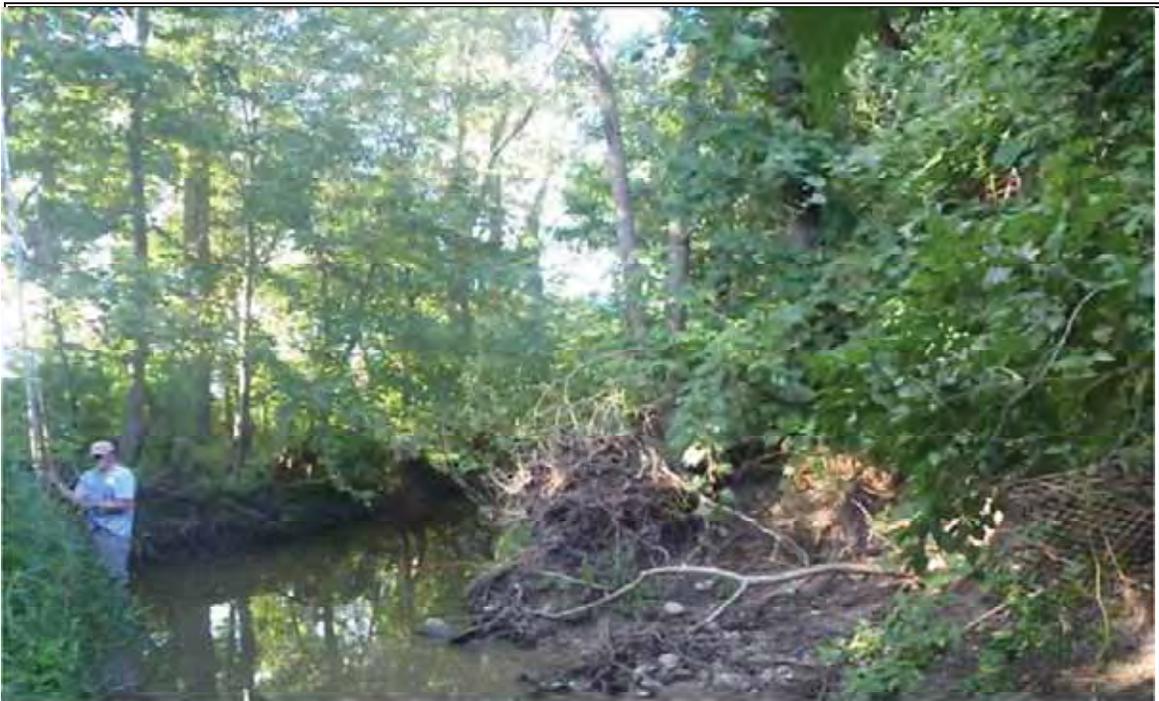
Photograph 13: View of MN-3, Net Set 4. Net Set 4 was a high net set north of Net Set 3B across the opening of the ATV access corridor, Firelands and Lyme Wind Farm Project. July 20, 2011.



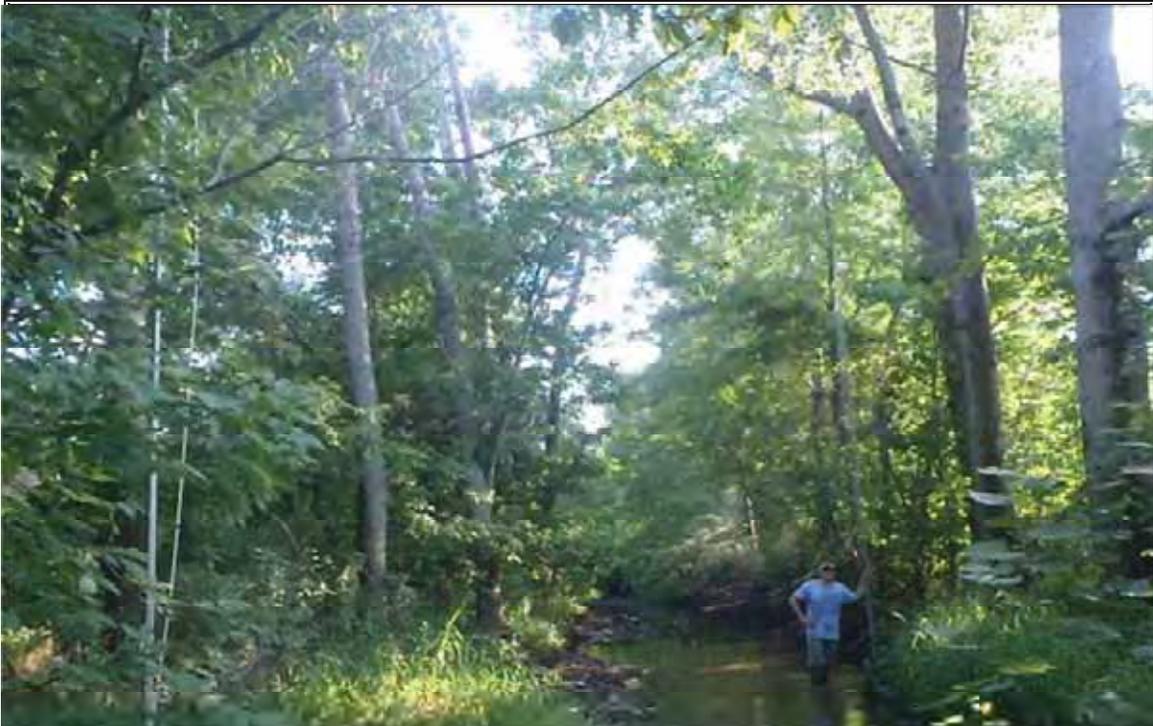
Photograph 14: View of MN-4, Net Set 1. Net Set 1 was set over Seymour Creek within a riparian corridor surrounded by agricultural fields. Firelands and Lyme Wind Farm Project. July 20, 2011.



Photograph 15: View of MN-4, Net Set 2. Net Set 2 was a high net set downstream of Net Set 1 across Seymour Creek within the riparian corridor. Firelands and Lyme Wind Farm Project. July 20, 2011.



Photograph 16: View of MN-4, Net Set 3. Net Set 3 was set downstream of Net Set 2 across a pooled section of Seymour Creek. Firelands and Lyme Wind Farm Project. July 20, 2011.



Photograph 17: View of MN-4, Net Set 4. Net Set 4 was set downstream of Net Set 3 across Seymour Creek within the riparian corridor. Firelands and Lyme Wind Farm Project. July 20, 2011.



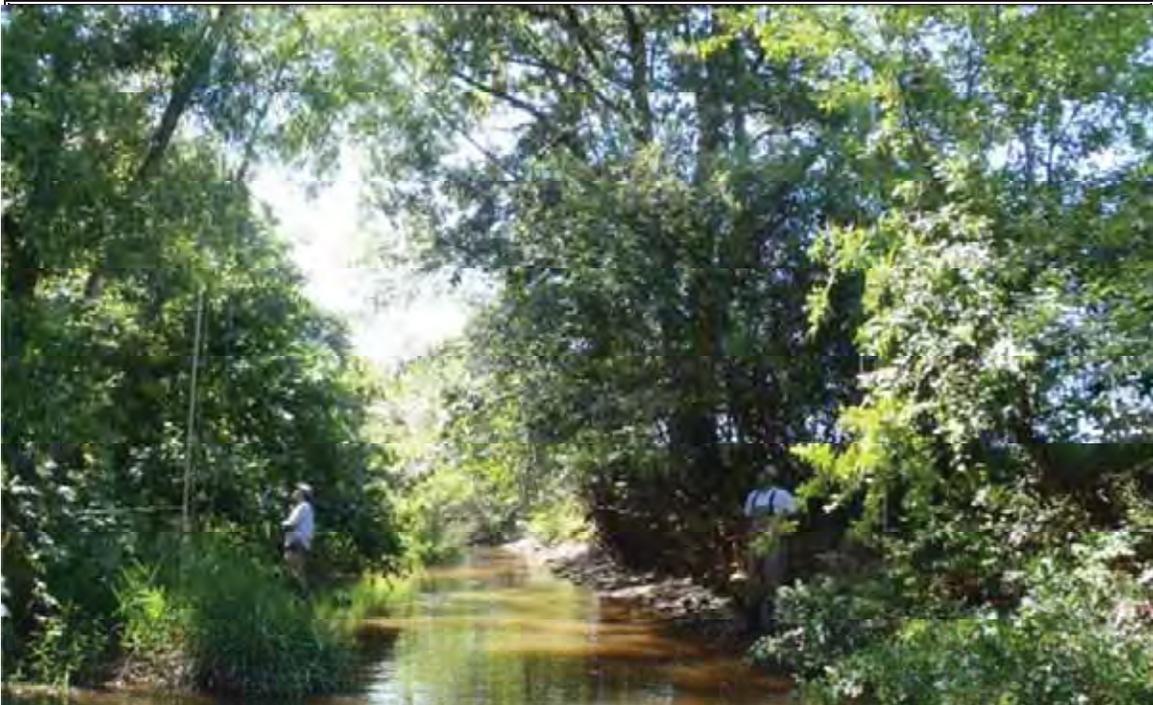
Photograph 18: View of MN-5, Net Set 1. Net Set 1 was a high net set over Seymour Creek within the edge of a young woodlot. Firelands and Lyme Wind Farm Project. July 25, 2011.



Photograph 19: View of MN-5, Net Set 2. Net Set 2 was set upstream of Net Set 1 over Seymour Creek within the woodlot. Firelands and Lyme Wind Farm Project. July 25, 2011.



Photograph 20: View of MN-5, Net Set 3. Net Set 3 was set upstream of Net Set 2 over Seymour Creek within the woodlot. Firelands and Lyme Wind Farm Project. July 25, 2011.



Photograph 21: View of MN-5, Net Set 4. Net Set 4 was set upstream of Net Set 3 over a pooled area of Seymour Creek within the woodlot. Firelands and Lyme Wind Farm Project. July 25, 2011.



Photograph 22: View of MN-6, Net Set 1 and 2. Net Sets 1 and 2 were placed perpendicularly to one another in a "T" shape. Net Sets were set over a dried up welland area within a woodlot. Firelands and Lyme Wind Farm Project. July 21, 2011.



Photograph 23: View of MN-6, Net Set 3. Net Set 3 was a high net set across an open corridor within the woodlot. Firelands and Lyme Wind Farm Project. July 21, 2011.



Photograph 24: View of MN-6, Net Set 4. Net Set 4 was placed across the opening of the woodlot into an agricultural field. Firelands and Lyme Wind Farm Project. July 21, 2011.



Photograph 25: View of MN-7, Net Set 1. Net Set 1 was set over Megginson Creek within a mature woodlot. Firelands and Lyme Wind Farm Project. July 27, 2011.



Photograph 26: View of MN-7, Net Set 2. Net Set 2 was a high net set over an access road parallel to Megginson Creek north of Net Set 1. Firelands and Lyme Wind Farm Project. July 27, 2011.



Photograph 27: View of MN-7, Net Set 3. Net Set 3 was set over Megginson Creek upstream of Net Set 1. Firelands and Lyme Wind Farm Project. July 27, 2011.



Photograph 28: View of MN-7, Net Set 4. Net Set 4 was set upstream of Net Set 3 over a bend in Megginson Creek. Firelands and Lyme Wind Farm Project. July 27, 2011.



Photograph 29: View of MN-8, Net Set 1. Net Set 1 was set perpendicularly to the riparian corridor in an open field. Firelands and Lyme Wind Farm Project. July 24, 2011.



Photograph 30: View of MN-8, Net Set 2. Net Set 2 was a high net set perpendicularly to a woodlot in an open field. Net Set 2 was located south of Net Set 1. Firelands and Lyme Wind Farm Project. July 24, 2011.



Photograph 31: View of MN-8, Net Set 3. Net Set 3 was set south of Net Set 2 parallel to the edge of the woodlot at an opening for vehicles. Firelands and Lyme Wind Farm Project. July 24, 2011.



Photograph 32: View of MN-8, Net Set 4. Net Set 4 was set west of Net Set 3 perpendicular to a fencerow that extended west from the woodlot. Firelands and Lyme Wind Farm Project. July 24, 2011.



Photograph 33: View of MN-9, Net Set 1. Net Set 1 was placed over Mills Creek within a riparian corridor. Firelands and Lyme Wind Farm Project. July 26, 2011.



Photograph 34: View of MN-9, Net Set 2. Net Set 2 was set upstream of Net Set 1 over Mills Creek with good canopy closure. Firelands and Lyme Wind Farm Project. July 26, 2011.



Photograph 35: View of MN-9, Net Set 3. Net Set 3 was set upstream of Net Set 2 over Mills Creek within the riparian corridor. Firelands and Lyme Wind Farm Project. July 26, 2011.



Photograph 36: View of MN-9, Net Set 4. Net Set 4 was a high net set perpendicularly along the edge of the Mills Creek riparian corridor in an open field. Firelands and Lyme Wind Farm Project. July 26, 2011.



Photograph 37: View of a male Big brown bat (*Eptesicus fuscus*) captured in Net Set 2 at MN-1, Firelands and Lyme Wind Farm Project. July 19, 2011.



Photograph 38: View of a male red bat (*Lasiurus borealis*) captured at MN-2. All bats were marked with orange face paint to avoid recapture. Firelands and Lyme Wind Farm Project. July 19, 2011.



Photograph 39: View of a male hoary bat (*Lasiurus cinereus*) captured in Net Set 2 at MN-8, Firelands and Lyme Wind Farm Project. July 26, 2011.



Photograph 40: View of a female northern bat (*Myotis septentrionalis*) captured in Net Set 2 at MN-4, Firelands and Lyme Wind Farm Project. July 20, 2011.



Photograph 41: View of a female little brown bat (*Myotis lucifugus*) captured in Net Set 4 at MN-7. Firelands and Lyme Wind Farm Project. July 29, 2011.



Photograph 42: View of a male evening bat (*Nycticeius humeralis*) captured in Net Set 4 at MN-6. Firelands and Lyme Wind Farm Project. July 25, 2011.



Photograph 43: View of the dental structure of a male evening bat (*Nycticeius humeralis*) captured in Net Set 4 at MN-6. Firelands and Lyme Wind Farm Project. July 25, 2011.

Appendix E

MIST NET SURVEY DATA SHEETS

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-1 Date: 7/19/2011

Surveyors: Kiersten Fuchs & Richard Fangman

Survey Type: Hibernacula Summer

Site description: flight corridor located along well maintained access on east side of large pond.
Young and medium-aged trees include black cherry and white mulberry.

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:15	20.6°	0-2.2	10%
End	02:15	19.5°	0-2.2	5%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (9m)	4576280.79407	362461.328373
2	Mist net	3 (12m)	4576065.13929	362460.386244
3	Mist net	2 (6m)	4576044.36302	362456.400085
4	Mist net	2 (6m)	4575966.01969	362440.542969
5				
6				
7				

Total net area: 202.8 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-1 Date: 7/19/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	5			1	6
Evening					
Silver-haired					
Eastern Red	1	1	1		3 (2)
Hoary					(1)
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	9 (3)

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. One bat captured at this site on this night had a score of 1, all others captured at this site on this night scored 0.

Numbers in parentheses indicate bats captured in net and identified to species prior to escape. Bats age and sex was not determined.

BAT SURVEY FORM

Project Name: Firelands/Lyme Project Area Site MN-1

Date: 7/19/2011

Species	Time (military)	Sex	Reproductive status	Measurements (millimeters and grams)			Net #	Recapture/Band #
				Forearm	Ear	Tragus		
EPFU	22:15	Male	Testes descended	50			4	
LABO	22:15	Escaped	-	-			-	
LABO	22:50	Male	Non-reproductive	39			10	
EPFU	22:50	Male	Non-reproductive	47			16	
EPFU	22:55	Female	Non-reproductive	48			17.5	
EPFU	00:20	Female	Non-reproductive	44			15.75	
EPFU	00:20	Male	Testes descended	47			14.5	
LABO	00:20	Escaped	-	-			-	
LABO	00:50	Male	Testes descended	41			12	
EPFU	00:50	Male	Non-reproductive	48			16.5	
LABO	00:55	Female	Non-reproductive	42			10.5	
LACI	01:00	Escaped	-	-			-	

Species code: Big brown (EPFU), Evening bat (NYHU), Silver-haired (LANO), Red (LABO), Hoary (LACI), Tri-colored (PESU), Rafinesque's big-eared (CORO)^{1,2}, Little brown (MYLU), Northern (MYSE), Small-footed (MYLE)¹, and Indiana (MYSO)^{1,2}.
Radio-telemetry, and documentation photographs required 1. Banding required 2.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-1 Date: 7/21/2011

Surveyors: Kiersten Fuchs & Richard Fangman

Survey Type: Hibernacula Summer

Site description: flight corridor located along well maintained access on east side of large pond.
Young and medium-aged trees include black cherry and white mulberry.

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:10	28.8°	0-2.2	30%
End	02:10	24°	0-2.2	20%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (<i>UTM NAD83 Zone 17N</i>)	
			Easting	Northing
1	Mist net	2 (9m)	4576280.79407	362461.328373
2	Mist net	3 (12m)	4576065.13929	362460.386244
3	Mist net	2 (6m)	4576044.36302	362456.400085
4	Mist net	2 (6m)	4575966.01969	362440.542969
5				
6				
7				

Total net area: 202.8 m²

Notes: _____

Project Name: Firelands/Lyme Project Area

Date: 7/21/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	2		1		3
Evening					
Silver-haired					
Eastern Red		1			1
Hoary					
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
Total:					4

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

Recapture not included in total.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-2 Date: 7/19/2011

Surveyors: Benjamin Deetsch & Neil Guthals

Survey Type: Hibernacula Summer

Site description: located on a perennial tributary to the Huron River. This open entrenched stream channel has a mature woods to the west and soybeans to the east.

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:05	33.3°	0-2.2	10%
End	02:05	22.2°	0-2.2	5%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (<i>UTM NAD83 Zone 17N</i>)	
			Easting	Northing
1	Mist net	3 (6m)	4574768.33878	359708.232262
2	Mist net	2 (9m)	4574732.97489	359719.229167
3	Mist net	2 (9m)	4574703.06655	359725.390052
4	Mist net	2 (6m)	4574656.20528	359745.597659
5				
6				
7				

Total net area: 171.6 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-2 Date: 7/19/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	8	3	1	1	13 (1)
Evening					
Silver-haired					
Eastern Red	1	2		1	4 (1)
Hoary		2			2
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	19 (2)

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. One bat captured at this site on this night had a score of 1, all others captured at this site on this night scored 0.

Numbers in parentheses indicate bats captured in net and identified to species prior to escape. Bats age and sex was not determined.

BAT SURVEY FORM

Project Name: Firelands/Lyme Project Area Site MN-2

Date: 7/19/2011

Species	Time (military)	Sex	Reproductive status	Measurements (millimeters and grams)			Net #	Recapture/Band #
				Forearm	Ear	Tragus		
LABO	21:25	Female	Non-reproductive	43			1	
EPFU	21:50	Female	Lactating	48			4	
EPFU	22:21	Male	Non-reproductive	48			1	
EPFU	22:24	Female	Non-reproductive	-			2	
LABO	22:27	Male	Testes descended	37			2	
EPFU	22:31	Male	Non-reproductive	49			3	
EPFU	22:52	Male	Testes descended	45			3	
EPFU	23:00	Female	Lactating	46			1	
LABO	23:12	Escaped	-	-			3	
EPFU	23:15	Male	Non-reproductive	45			4	
EPFU	23:25	Female	Non-reproductive	45			1	
EPFU	23:27	Male	Non-reproductive	42			1	
EPFU	23:29	Male	Testes descended	46			1	
EPFU	23:31	Male	Non-reproductive	43			1	
LABO	23:35	Female	Non-reproductive	40			1	
EPFU	23:56	Male	Testes descended	47			2	
EPFU	00:00	Male	Non-reproductive	44			1	

Species code: Big brown (EPFU), Evening bat (NYHU), Silver-haired (LANO), Red (LABO), Hoary (LACI), Tri-colored (PESU), Rafinesque's big-eared (CORO)^{1,2}, Little brown (MYLU), Northern (MYSE), Small-footed (MYLE)¹, and Indiana (MYSO)^{1,2}.
Radio-telemetry, and documentation photographs required 1. Banding required 2.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-2 Date: 7/22/2011

Surveyors: Benjamin Deetsch & Neil Guthals

Survey Type: Hibernacula Summer

Site description: located on a perennial tributary to the Huron River. This open entrenched stream channel has a mature woods to the west and soybeans to the east.

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:05	24.4°	0-2.2	50%
End	00:15	24.4°	0-2.2	100%

Notes: Rain out, shut nets at 00:15

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (<i>UTM NAD83 Zone 17N</i>)	
			Easting	Northing
1	Mist net	3 (6m)	4574768.33878	359708.232262
2	Mist net	2 (9m)	4574732.97489	359719.229167
3	Mist net	2 (9m)	4574703.06655	359725.390052
4	Mist net	2 (6m)	4574656.20528	359745.597659
5				
6				
7				

Total net area: 171.6 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-2 Date: 7/22/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown		2			2
Evening					
Silver-haired					
Eastern Red				1	1 (1)
Hoary					
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	3 (1)

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

Numbers in parentheses indicate bats captured in net and identified to species prior to escape. Bats age and sex was not determined.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-2 Date: 7/23/2011

Surveyors: Benjamin Deetsch & Neil Guthals

Survey Type: Hibernacula Summer

Site description: _____

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start				
End				

Notes: Rain out, nets never opened

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (<i>UTM NAD83 Zone 17N</i>)	
			Easting	Northing
1				
2				
3				
4				
5				
6				
7				

Total net area: _____

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-2 Date: 7/23/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown					
Evening					
Silver-haired					
Eastern Red					
Hoary					
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	

Notes:

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-2 Date: 7/24/2011

Surveyors: Benjamin Deetsch & Neil Guthals

Survey Type: Hibernacula Summer

Site description: located on a perennial tributary to the Huron River. This open entrenched stream channel has a mature woods to the west and soybeans to the east.

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	27.8°	0-2.2	10%
End	02:00	24.4°	0-2.2	10%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	3 (6m)	4574768.33878	359708.232262
2	Mist net	2 (9m)	4574732.97489	359719.229167
3	Mist net	2 (9m)	4574703.06655	359725.390052
4	Mist net	2 (6m)	4574656.20528	359745.597659
5				
6				
7				

Total net area: 171.6 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-2 Date: 7/24/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown		5	4	4	13 (2)
Evening		1			1
Silver-haired					
Eastern Red	1	1	1	2	5 (1)
Hoary					
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	19 (3)

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

Numbers in parentheses indicate bats captured in net and identified to species prior to escape. Bats age and sex was not determined.

BAT SURVEY FORM

Project Name: Firelands/Lyme Project Area Site MN-2

Date: 7/24/2011

Species	Time (military)	Sex	Reproductive status	Measurements (millimeters and grams)			Net #	Recapture/Band #
				Forearm	Ear	Tragus		
EPFU	21:50	Female	Non-reproductive	47	14	6	17	1
EPFU	21:55	Female	Post Lactating	46	13	6	18.6	1
LABO	21:55	Escaped	-	-	-	-	-	1
EPFU	22:05	Female	Non-reproductive	48	14	7	19.1	2
EPFU	22:15	Male	Non-reproductive	46	11	4	15.1	1
EPFU	22:15	Female	Non-reproductive	48	14	6	17.4	1
EPFU	22:40	Female	Lactating	47	14	7	26	1
EPFU	22:40	Female	Non-reproductive	48	15	6	19.5	3
EPFU	22:40	Female	Non-reproductive	43	13	5	15	2
EPFU	22:45	Male	Non-reproductive	46	14	7	17.6	4
LABO	23:00	Female	Non-reproductive	42	12	5	11.4	2
LABO	23:08	Male	Non-reproductive	40	9	3	11.1	1
EPFU	23:15	Male	Non-reproductive	44	12	6	16.7	4
NYHU	23:20	Female	Lactating	39	11	4	12	1
EPFU	23:20	Escaped	-	-	-	-	-	1
LABO	23:20	Female	Lactating	41	8	3	15.6	2
EPFU	00:00	Escaped	-	-	-	-	-	3

Species code: Big brown (EPFU), Evening bat (NYHU), Silver-haired (LANO), Red (LABO), Hoary (LACI), Tri-colored (PESU), Rafinesque's big-eared (CORO)^{1,2}, Little brown (MYLU), Northern (MYSE), Small-footed (MYLE)¹, and Indiana (MYSO)^{1,2}.
Radio-telemetry, and documentation photographs required 1. Banding required 2.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-3 Date: 7/20/2011

Surveyors: Kiersten Fuchs & Richard Fangman

Survey Type: Hibernacula Summer

Site description: located along an ATV trail within a mature woodlot that includes shagbark hickory, white ash, white oak and red oak

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	26.7°	2.3-4.4	15%
End	02:00	25.7°	2.3-4.4	20%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (6m)	4570947.68705	354874.690619
2	Mist net	2 (9m)	4570982.29305	354872.235101
3	Mist net	2 (6m)	4571011.46609	354873.266446
4	Mist net	3 (6m)	4571062.72063	354872.491376
5				
6				
7				

Total net area: 156 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-3 Date: 7/20/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	2				2
Evening					
Silver-haired					
Eastern Red					
Hoary					
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	2

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-3 Date: 7/22/2011

Surveyors: Kiersten Fuchs & Richard Fangman

Survey Type: Hibernacula Summer

Site description: located along an ATV trail within a mature woodlot that includes shagbark hickory, white ash, white oak and red oak

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	23.3°	2.3-4.4	30%
End	01:15	25°	2.3-4.4	100%

Notes: Rain out, shut nets at 01:15

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (6m)	4570947.68705	354874.690619
2	Mist net	2 (9m)	4570982.29305	354872.235101
3	Mist net	2 (12m)	4571001.81158	354879.366107
4	Mist net	3 (6m)	4571062.72063	354872.491376
5				
6				
7				

Total net area: 187.2 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-3 Date: 7/22/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	2	3			5
Evening					
Silver-haired					
Eastern Red	1				1
Hoary					
Tri-colored bat					
Little brown					
Northern		1			1
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	7

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-3 Date: 7/23/2011

Surveyors: Kiersten Fuchs & Richard Fangman

Survey Type: Hibernacula Summer

Site description: located along an ATV trail within a mature woodlot that includes shagbark hickory, white ash, white oak and red oak

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start				
End				

Notes: Rain out, nets never opened

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (<i>UTM NAD83 Zone 17N</i>)	
			Easting	Northing
1				
2				
3				
4				
5				
6				
7				

Total net area: _____

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-3 Date: 7/23/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown					
Evening					
Silver-haired					
Eastern Red					
Hoary					
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	

Notes:

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-3 Date: 7/24/2011

Surveyors: Kiersten Fuchs & Richard Fangman

Survey Type: Hibernacula Summer

Site description: located along an ATV trail within a mature woodlot that includes shagbark hickory, white ash, white oak and red oak

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	26.1°	0-2.2	10%
End	02:00	22.3°	0-2.2	10%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (9m)	4570947.68705	354874.690619
2	Mist net	2 (9m)	4570982.29305	354872.235101
3	Mist net	2 (12m)	4571001.81158	354879.366107
4	Mist net	3 (6m)	4571062.72063	354872.491376
5				
6				
7				

Total net area: 202.8 m²

Notes: Net 3 moved and reset (3B) due to tree that fell during storm on 7/22/2011

Project Name: Firelands/Lyme Project Area Site MN-3 Date: 7/24/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown		2			2
Evening					
Silver-haired					
Eastern Red	1				1
Hoary					
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	3

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-4 Date: 7/20/2011

Surveyors: Benjamin Deetsch & Neil Guthals

Survey Type: Hibernacula Summer

Site description: located over Seymour Creek within the riparian corridor made up of E. cottonwood, green ash, black cherry, silver maple and box elder

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:05	28.9°	0-2.2	0%
End	02:05	26.1°	0-2.2	0%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (6m)	4563279.99894	356619.450990
2	Mist net	3 (6m)	456926.78710	356691.767372
3	Mist net	2 (9m)	4569290.62294	356745.538237
4	Mist net	2 (9m)	4569276.35432	356622.976066
5				
6				
7				

Total net area: 171.6 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-4 Date: 7/20/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown		2			2
Evening					
Silver-haired					
Eastern Red		1		1	2 (1)
Hoary					
Tri-colored bat					
Little brown					
Northern		2		2	4
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	8 (1)

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

Numbers in parentheses indicate bats captured in net and identified to species prior to escape. Bats age and sex was not determined.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-4 Date: 7/25/2011

Surveyors: Benjamin Deetsch & Neil Guthals

Survey Type: Hibernacula Summer

Site description: located over Seymour Creek within the riparian corridor made up of E. cottonwood, green ash, black cherry, silver maple and box elder

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	28.3°	0-2.2	0%
End	02:15	21.7°	0-2.2	20%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (6m)	4563279.99894	356619.450990
2	Mist net	3 (6m)	456926.78710	356691.767372
3	Mist net	2 (9m)	4569290.62294	356745.538237
4	Mist net	2 (9m)	4569276.35432	356622.976066
5				
6				
7				

Total net area: 171.6 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-4 Date: 7/25/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown				1	1
Evening					
Silver-haired					
Eastern Red		1		1	2
Hoary					
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	3

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-5 Date: 7/26/2011

Surveyors: Benjamin Deetsch & Neil Guthals

Survey Type: Hibernacula Summer

Site description: located over Seymour Creek with the young woods riparian corridor. The woods were made of green ash, black walnut, hawthorn and slippery elm.

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	26.1°	0-2.2	40%
End	02:00	18.9°	0-2.2	5%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	3 (9m)	4570191.47648	358112.689608
2	Mist net	2 (6m)	4570155.73439	358081.876091
3	Mist net	2 (9m)	4570121.93663	358043.008231
4	Mist net	2 (6m)	4570124.25942	357985.067261
5				
6				
7				

Total net area: 156 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-5 Date: 7/26/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	1				1
Evening					
Silver-haired					
Eastern Red				1	1
Hoary					
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	2

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-5 Date: 7/28/2011

Surveyors: Benjamin Deetsch & Neil Guthals

Survey Type: Hibernacula Summer

Site description: located over Seymour Creek with the young woods riparian corridor. The woods were made of green ash, black walnut, hawthorn and slippery elm.

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	28.9°	0-2.2	15%
End	02:00	25.6°	0-2.2	15%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	3 (9m)	4570191.47648	358112.689608
2	Mist net	2 (6m)	4570155.73439	358081.876091
3	Mist net	2 (9m)	4570121.93663	358043.008231
4	Mist net	2 (6m)	4570124.25942	357985.067261
5				
6				
7				

Total net area: 179.4 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-5 Date: 7/28/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown					
Evening					
Silver-haired					
Eastern Red		1		1	2
Hoary					
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
Total:					2

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-6 Date: 7/21/2011

Surveyors: Benjamin Deetsch & Neil Guthals

Survey Type: Hibernacula Summer

Site description: located within medium-aged woodlot with a small potential emergent wetland

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:05	32.8°	0-2.2	30%
End	02:15	28.9°	0-2.2	20%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (9m)	4575409.18882	360337.775196
2	Mist net	2 (9m)	4575414.51442	360339.673667
3	Mist net	3 (9m)	4575442.78121	360387.829356
4	Mist net	2 (6m)	4575454.68409	360388.507852
5				
6				
7				

Total net area: 195 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-6 Date: 7/21/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	1	1			2
Evening					
Silver-haired					
Eastern Red					
Hoary	1				1
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	3

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-6 Date: 7/25/2011

Surveyors: Benjamin Deetsch & Neil Guthals

Survey Type: Hibernacula Summer

Site description: located within medium-aged woodlot with a small potential emergent wetland

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	24.9°	0-2.2	10%
End	02:10	21.2°	0-2.2	10%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (9m)	4575409.18882	360337.775196
2	Mist net	2 (9m)	4575414.51442	360339.673667
3	Mist net	3 (9m)	4575442.78121	360387.829356
4	Mist net	2 (6m)	4575454.68409	360388.507852
5				
6				
7				

Total net area: 195 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-6 Date: 7/25/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	1	1			2
Evening	1				1
Silver-haired					
Eastern Red	1				1
Hoary					
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
Total:					4

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

Recaptures not included in total.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-7 Date: 7/27/2011

Surveyors: Benjamin Deetsch & Neil Guthals

Survey Type: Hibernacula Summer

Site description: located over and adjacent to Megginson Creek. This entrenched creek has a mature woods on both sides with an access road along the western bank.

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	27.8°	0-2.2	20%
End	02:00	24.4°	0-2.2	100%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (6m)	4565570.19929	347401.242274
2	Mist net	3(12m)	4565629.28462	347424.971377
3	Mist net	2 (6m)	4565677.67062	347333.770561
4	Mist net	2 (6m)	4565668.68960	347335.832111
5				
6				
7				

Total net area: 187.2 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-7 Date: 7/27/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	9	7	2	6	24
Evening					
Silver-haired					
Eastern Red	1	1			2
Hoary					
Tri-colored bat					
Little brown	2				2
Northern		1			1
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	29

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

Recaptures not included in total.

BAT SURVEY FORM

Project Name: Firelands/Lyme Project Area Site MN-7

Date: 7/27/2011

Species	Time (military)	Sex	Reproductive status	Measurements (millimeters and grams)			Tragus	Weight	Net #	Recapture/Band #
				Forearm	Ear	Ear				
LABO	21:24	Female	Non-reproductive	31	9	4	14.2	1		
MYSE	21:35	Female	Lactating	36	16	7	8	3		
EPFU	21:40	Male	Non-reproductive	46	15	6	16	3		
EPFU	21:50	Female	Lactating	47	13	6	17.5	1		
EPFU	21:52	Male	Testes descended	44	14	6	17	1		
EPFU	21:54	Female	Non-reproductive	45	13	6	16.4	3		
EPFU	22:05	Female	Lactating	47	14	6	16.5	4		
EPFU	22:18	Male	Non-reproductive	47	14	8	16.1	3		
EPFU	22:18	Female	Non-reproductive	47	13	6	15	3		
EPFU	22:25	Male	Non-reproductive	43	13	6	15.1	4		
LABO	22:30	Male	Testes descended	39	9	5	11	2		
EPFU	22:39	Female	Non-reproductive	46	15	6	18.5	3		
EPFU	22:40	Male	Testes descended	47	15	6	15	3		
EPFU	22:50	Female	Non-reproductive	46	16	7	21.5	2		
EPFU	22:55	Female	Non-reproductive	48	15	7	19	1		
EPFU	23:00	Male	Testes descended	48	16	8	16	4		
EPFU	23:10	Male	Non-reproductive	46	16	7	14	3		

Species code: Big brown (EPFU), Evening bat (NYHU), Silver-haired (LANO), Red (LABO), Hoary (LACI), Tri-colored (PESU), Rafinesque's big-eared (CORO)^{1,2}, Little brown (MYLU), Northern (MYSE), Small-footed (MYLE)¹, and Indiana (MYSO)^{1,2}.
Radio-telemetry, and documentation photographs required 1. Banding required 2.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-7 Date: 7/29/2011

Surveyors: Benjamin Deetsch & Neil Guthals

Survey Type: Hibernacula Summer

Site description: located over and adjacent to Megginson Creek. This entrenched creek has a mature woods on both sides with an access road along the western bank.

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	27.8°	0-2.2	10%
End	02:00	22.2°	0-2.2	0%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (6m)	4565570.19929	347401.242274
2	Mist net	3(12m)	4565629.28462	347424.971377
3	Mist net	2 (6m)	4565677.67062	347333.770561
4	Mist net	2 (6m)	4565668.68960	347335.832111
5				
6				
7				

Total net area: 187.2 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-7 Date: 7/29/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	2	2			4
Evening					
Silver-haired					
Eastern Red	1				1
Hoary					
Tri-colored bat					
Little brown				1	1
Northern		1	2		3
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	9

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-8 Date: 7/26/2011

Surveyors: Kiersten Fuchs & Richard Fangman

Survey Type: Hibernacula Summer

Site description: located along the edge of medium-aged woodlot including white oak, black walnut, shagbark hickory and osage orange

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	21.2°	0-2.2	20%
End	01:10	16°	0-2.2	10%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (9m)	4572412.32297	353294.243131
2	Mist net	2 (9m)	4572343.90611	353289.267517
3	Mist net	3 (12m)	4572242.68694	353285.875700
4	Mist net	2 (12m)	4572236.22558	353192.720854
5				
6				
7				

Total net area: 249.6 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-8 Date: 7/26/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	1	1			2
Evening					
Silver-haired					
Eastern Red		2			2 (1)
Hoary	1				1
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
Total:					5 (1)

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. One bat captured at this site on this night had a score of 1, all others captured at this site on this night scored 0.

Numbers in parentheses indicate bats captured in net and identified to species prior to escape. Bats age and sex was not determined.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-8 Date: 7/28/2011

Surveyors: Kiersten Fuchs & Richard Fangman

Survey Type: Hibernacula Summer

Site description: located along the edge of medium-aged woodlot including white oak, black walnut, shagbark hickory and osage orange

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	20:56	24°	0-2.2	10%
End	02:00	22.9°	0-2.2	10%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (12m)	4572412.32297	353294.243131
2	Mist net	3 (12m)	4572343.90611	353289.267517
3	Mist net	2 (9m)	4572242.68694	353285.875700
4	Mist net	2 (9m)	4572236.22558	353192.720854
5				
6				
7				

Total net area: 249.6 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-8 Date: 7/28/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	4	3			7 (1)
Evening					
Silver-haired					
Eastern Red		3			3
Hoary					
Tri-colored bat					
Little brown					
Northern					
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	10 (1)

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

Numbers in parentheses indicate bats captured in net and identified to species prior to escape. Bats age and sex was not determined.

BAT SURVEY FORM

Project Name: Firelands/Lyme Project Area Site MN-8

Date: 7/28/2011

Species	Time <i>(military)</i>	Sex	Reproductive status	Measurements (millimeters and grams)				Net #	Recapture/Band #
				Forearm	Ear	Tragus	Weight		
EPFU	21:20	Male	Testes descended	48	12	6	15.2	1	
LABO	21:38	Female	Non-reproductive	39	11	6	12.8	4	
EPFU	21:45	Male	Testes descended	46	13	6	14.2	2	
EPFU	22:00	Female	Lactating	44	14	6	16.2	2	
EPFU	22:15	Escaped	-	-	-	-	-	1	
EPFU	22:15	Male	Non-reproductive	48	13	4	16	3	
LABO	22:17	Female	Lactating	42	10	4	13.75	4	
EPFU	22:45	Male	Testes descended	43	14	7	14.2	2	
EPFU	23:02	Female	Post lactating	48	14	5	17.5	4	
LABO	23:02	Female	Lactating	42	11	6	13.2	4	
EPFU	01:20	Female	Post lactating	48	15	7	16.5	2	

Species code: Big brown (EPFU), Evening bat (NYHU), Silver-haired (LANO), Red (LABO), Hoary (LACI), Tri-colored (PESU), Rafinesque's big-eared (CORO)^{1,2}, Little brown (MYLU), Northern (MYSE), Small-footed (MYLE)¹, and Indiana (MYSO)^{1,2}.
Radio-telemetry, and documentation photographs required 1. Banding required 2.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-9 Date: 7/27/2011

Surveyors: Kiersten Fuchs & Richard Fangman

Survey Type: Hibernacula Summer

Site description: located over Mills Creek and within the edge habitat in an adjacent field

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	23.4°	0-2.2	20%
End	02:05	23.2°	0-2.2	70%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (6m)	4576732.98604	347747.617013
2	Mist net	2 (6m)	4576683.39482	347782.508825
3	Mist net	2 (6m)	4576643.89884	347790.662780
4	Mist net	3 (9m)	4576611.31204	347781.895586
5				
6				
7				

Total net area: 163.8 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-9 Date: 7/27/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown					
Evening					
Silver-haired					
Eastern Red		2			2
Hoary					
Tri-colored bat					
Little brown	1				1
Northern	5	4			9
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
Total:					12

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

BAT SURVEY FORM

Project Name: Firelands/Lyme Project Area Site MN-9

Date: 7/27/2011

Species	Time <i>(military)</i>	Sex	Reproductive status	Measurements (millimeters and grams)			Net #	Recapture/Band #
				Forearm	Ear	Tragus		
LABO	21:25	Female	Lactating	43	11	5	14	4
MYSE	21:55	Male	Non-reproductive	35	14	7	6.5	2
MYSE	22:45	Male	Non-reproductive	35	15	8	6.9	2
MYSE	22:55	Female	Lactating	37	15	7	8.25	4
MYSE	23:05	Male	Non-reproductive	36	15	8	7	1
MYSE	23:15	Female	Post lactating	38	14	7	8.75	4
MYSE	23:35	Male	Testes descended	36	14	6	6.25	3
MYSE	00:40	Male	Testes descended	36	16	8	6	3
MYLU	01:04	Male	Non-reproductive	39	11	4	7	1
MYSE	01:20	Female	Post lactating	38	15	8	7.5	2
MYSE	01:20	Female	Lactating	36	17	9	7	1
LABO	01:30	Female	Non-reproductive	40	9	4	11.5	4

Species code: Big brown (EPFU), Evening bat (NYHU), Silver-haired (LANO), Red (LABO), Hoary (LACI), Tri-colored (PESU), Rafinesque's big-eared (CORO)^{1,2}, Little brown (MYLU), Northern (MYSE), Small-footed (MYLE)¹, and Indiana (MYSO)^{1,2}.
Radio-telemetry, and documentation photographs required 1. Banding required 2.

NIGHTLY BAT SURVEY SUMMARY FORM

Project Name: Firelands/Lyme Project Area Site MN-9 Date: 7/29/2011

Surveyors: Kiersten Fuchs & Richard Fangman

Survey Type: Hibernacula Summer

Site description: located over Mills Creek and within the edge habitat in an adjacent field

Time and Weather

	Time	Temp (°C)	Wind Speed (m/s)	Cloud Cover (%)
Start	21:00	22.2°	0-2.2	10%
End	02:00	19.1°	0-2.2	10%

Notes: _____

Trap type and location

Set #	Trap type (harp trap or mist net)	Size (note if stacked mist nets)	Location (UTM NAD83 Zone 17N)	
			Easting	Northing
1	Mist net	2 (6m)	4576732.98604	347747.617013
2	Mist net	2 (6m)	4576683.39482	347782.508825
3	Mist net	2 (6m)	4576643.89884	347790.662780
4	Mist net	3 (9m)	4576611.31204	347781.895586
5				
6				
7				

Total net area: 163.8 m²

Notes: _____

Project Name: Firelands/Lyme Project Area Site MN-9 Date: 7/29/2011

Capture summary

Species	Adult		Juvenile		Subtotal
	Male	Female	Male	Female	
Big Brown	1	2			3
Evening					
Silver-haired					
Eastern Red	2				2
Hoary					
Tri-colored bat					
Little brown					
Northern		2			2
Small-footed					
Indiana					
Rafinesque's big-eared					
Other:					
				Total:	7

Notes: All bats captured were scored using "Wing-Damage Index used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome" by Jonathan Reichard. All bats captured at this site on this night scored 0.

This foregoing document was electronically filed with the Public Utilities

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Case No(s). 18-1607-EL-BGN

Summary: Application - Part 9 of 17 electronically filed by Christine M.T. Pirik on behalf of Firelands Wind, LLC