

# **JERICO RISE WIND FARM ACOUSTIC AND MIST-NET BAT SURVEY REPORT FRANKLIN COUNTY, NEW YORK**

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**June 17 – August 16, 2015**



**Prepared for:**

**EDP Renewables North America**

Houston, Texas 77002

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## EXECUTIVE SUMMARY

EDP Renewables North America is considering the development of the Jericho Rise Wind Farm (Project) in Franklin County, New York. In 2015, EDP Renewables North America contracted Western Ecosystems Technology, Inc. to conduct acoustic bat and mist-net surveys at the Project. The main objectives of the summer bat surveys were to: 1) to determine the summer presence/probable absence of the northern long-eared bat (NLEB) in areas potentially affected by construction activity and operation of the facility; and 2) determine sites where follow-up mist-netting for the NLEB should be conducted. Bat survey methods and the survey locations were reviewed and approved by US Fish and Wildlife Service (USFWS).

Following the USFWS 2015 Indiana Bat summer survey guidance, the level of effort for acoustic surveys is to be determined as one survey station within each approximate 1-km segment containing suitable forest habitat blocks along linear survey area. USFWS defines suitable habitat for the NLEB as any forest (e.g., deciduous, coniferous, mixed) or forested landscape feature (e.g., woody wetlands, forested riparian areas, shelterbelts). Desktop land-use/land-cover habitat assessment determined that the Project linear survey area required 48 survey locations. If NLEB were positively detected at any of the acoustic survey sites then follow up mist-net surveys were conducted in the approximate location of the acoustic site. Presence/probable absence follow up mist-net surveys were conducted at two of the 48 acoustic sites.

Based on the habitat assessment and USFWS recommendations, bat surveys were conducted at 48 sites. Acoustic presence/probable absence surveys were conducted at 48 sites with sampling occurring during 159 detector nights. NLEB echolocation calls were identified at two of the 48 acoustic sites. Qualitative review confirmed NLEB at two sites (4.2%). NLEB are considered to be likely absent from 46 of 48 sites (95.8%).

Follow up mist-net surveys were conducted at the two positive acoustic sites in order to capture NLEB, conduct telemetry surveys, and locate roost trees used by this species if possible. Mist-net surveys were completed at both sites between August 6 and August 9, 2015. A total of 5 bats (two big brown and three little brown bats) were captured. No NLEB were captured during 2015 mist-net surveys.

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**REPORT REFERENCE**

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## BACKGROUND AND PROJECT OVERVIEW

EDP Renewables North America (EDPR) is developing the Jericho Rise Wind Farm (Project) in Franklin County, New York. In 2015, EDPR contracted Western EcoSystems Technology, Inc. (WEST) to conduct acoustic and mist-net surveys for northern long-eared bats (NLEB; *Myotis septentrionalis*) at the Project. The main objectives of the summer bat surveys were to: 1) to determine the summer presence/probable absence of the NLEB in areas potentially affected by construction activity and operation of the facility; and 2) determine sites where follow-up mist-netting for the NLEB should be conducted.

Following the US Fish and Wildlife Service (USFWS) 2015 Indiana Bat summer survey guidance, the level of effort for acoustic surveys is to be determined as one survey station within each approximate 1-km segment containing suitable forest habitat blocks along linear survey area. USFWS (USFWS 2015) defines suitable habitat for the NLEB as any forest (e.g., deciduous, coniferous, mixed) or forested landscape feature (e.g., woody wetlands, forested riparian areas, shelterbelts). Desktop land-use/land-cover (LU/LC) habitat assessment determined that the Project linear survey area required 48 survey locations (Appendix A1). If NLEB were positively detected at any of the acoustic survey sites then follow up mist-net surveys were conducted in the approximate location of the acoustic site. Presence/probable absence follow up mist-net surveys were conducted at two of the 48 acoustic sites (Appendix A2, A3, and A4).

Based on habitat assessment and USFWS recommendations, bat surveys were conducted at 48 sites. Prior to surveys being bat survey methods and the survey locations were reviewed and approved by USFWS. Acoustic presence/probable absence surveys were conducted at 48 sites (Appendix A2). NLEB echolocation calls were identified at two of the 48 acoustic sites. Follow up mist-net surveys were conducted at the two positive acoustic sites in order to capture NLEB, conduct telemetry surveys, and locate roost trees used by this species if possible. The following report summarizes the results of acoustic and mist-net surveys conducted during summer 2015.

## OVERVIEW OF BAT DIVERSITY

Eleven species of bats are found in New York. Those species include: the big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), hoary bat (*L. cinereus*), northern yellow bat (*L. intermedius*), Seminole bat (*L. seminolus*), silver-haired bat (*Lasionycteris noctivagans*), Indiana bat (*Myotis sodalis*), little brown bat (*M. lucifugus*), NLEB, eastern small-footed bat (*M. leibii*), and tri-colored bat (*Perimyotis subflavus*). Of the eleven species known to occur in New York two are federally listed under the Endangered Species Act (ESA). Indiana bats are listed as endangered and NLEB are listed as threatened. In addition, the eastern small-footed bat is considered a New York species of concern. 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 NLEB, are experiencing population declines (Frick et al. 2010, USFWS 2013).

## METHODS

### Acoustic Surveys

Acoustic surveys were conducted following guidance in the 2015 Range-Wide Indiana Bat Summer Survey Guidelines, which is also used for NLEB presence/probable absence surveys (USFWS 2015) and the NLEB Interim Conference and Planning Guidance (USFWS 2014).

Acoustic surveys were conducted during a time period consistent with USFWS guidelines (June 17 through August 15; USFWS 2014, 2015). Bats were surveyed using AnaBat™ ultrasonic detectors (Titley Electronics Pty Ltd., NSW, Australia). Acoustic monitoring began before sunset and continued for the entire night. Survey duration at each site was a minimum of two nights. If weather conditions such as persistent rain (more than 30 minutes), strong winds (greater than 9 mph for more than 30 minutes), or persistent cold temperatures (below 10°C [50°F] for more than 30 minutes) occurred during the first five hours of a survey night, then that site was surveyed for an additional night (USFWS 2014, 2015). Weather conditions were checked with the following weather stations, which can be found on Weather Underground's Wundermap (<http://www.wunderground.com/wundermap/>): Brainardsville, NY. To maximize the quality of recorded echolocation calls, detectors were positioned at least one meter off the ground, at a 45° angle or greater, and with PVC tube weatherproofing (Britzke et al. 2010, USFWS 2014, 2015). Sensitivity was set to 6 on all detectors.

Bat calls were quantitatively identified using Bat Call Identification (BCID; version 2.7c; Allen 2013) and Kaleidoscope (version 3.1.2; Bats of North America classifier version 3.1.0; Wildlife Acoustics). While using BCID, the appropriate state (New York) was selected, and the default settings were adopted. For Kaleidoscope, the appropriate state (New York) from the Bats of North America classifier (version 3.1.0) was selected, and the most sensitive (i.e., most liberal) setting was used. For both software settings, Indiana bats were not included as a possible species in the models because they aren't known to occur within the Project. All calls identified as NLEB by automated ID software were verified via qualitative call analysis by a biologist experienced with acoustic identification and who met required USFWS qualifications (Jeff Gruver; USFWS 2015). As well, if a night exceeded the maximum likelihood threshold (p-value < 0.05) for NLEB, all files from that night received qualitative review. If call sequences were not characteristic of NLEB bats, contained distinct calls produced by species other than NLEB bats, or were of insufficient quality, they were reclassified as another species or as unknown. NLEB were considered present at sites with probable NLEB calls flagged by automated analysis **and** verified by qualitative review. NLEB were considered likely absent from sites with no probable NLEB bat calls or from sites with probable NLEB bat calls that were overruled by qualitative analysis.

## Mist-Net Surveys

Follow up mist-net surveys were conducted following guidance in the 2015 Range-Wide Indiana Bat Summer Survey Guidelines (USFWS 2015) and the NLEB Interim Conference and Planning Guidance (USFWS 2014).

Mist-net surveys were conducted during a time period consistent with USFWS guidelines (May 15 through August 15; USFWS 2014, 2015). Standard two-ply, 50 denier, nylon mist-nets with a mesh size of 38 millimeters (1.30 inches) were used at all mist-net sites. Mist-netting began at sunset and continued for at least five hours. Nets were checked every 10 minutes. Net locations were typically established at least 30 meters (98.4 feet) apart within each mist-net site whenever possible. Disturbance in the form of noise and movement were minimized at all net locations. Two mist-net locations per site were surveyed. Mist-nets were located in the general vicinity of acoustic detection sites in suitable bat habitat. Specific mist-net sites were determined on-site by permitted bat biologists with NLEB research experience. If weather conditions such as persistent rain (more than 30 minutes), strong winds (greater than 9 mph for more than 30 minutes), or cold temperature (below 10°C [50°F] for more than 30 minutes) occurred during the netting period, then those net nights were re-surveyed. All mist-net surveys were performed by staff permitted and approved by USFWS (Permit # TE234121-7), and New York Department of Environmental Conservation (NY-DEC; Endangered/Threatened Species: Scientific License #84) to capture and handle NLEB.

For each mist-net night the date, start and end time, site description, site coordinates, mist-net specifics, and weather data (temperature, cloud cover, wind speed, precipitation, and moon phase) were recorded. All captured bats were identified to species. In addition, sex, age, reproductive condition, body mass (grams), forearm length (millimeters), and capture status (recapture/new) were recorded. To assess exposure to White-Nose Syndrome (WNS), a Reichard Index score (0-3) was recorded for all captured bats. To prevent cross contamination of captured bats with *Pseudogymnoascus destructans*, the fungus that causes WNS, the USFWS WNS decontamination protocols were followed for all mist-netting efforts. Captured bats were measured and processed immediately and were usually released within 15 minutes. Species of bats captured were photo-documented. For NLEB and little brown bats, if captured, voucher photographs of species-specific identifiable features (e.g. head, body, calcar, foot, toe hairs etc.) were taken. Numbered metal forearm bands were attached to NLEB and little brown bats if captured.

## RESULTS

### Acoustic Surveys

WEST conducted acoustic surveys from June 17 - August 16, 2015. UTM coordinates and brief site descriptions for each site are listed in Table 1. Maps and photographs of acoustic survey sites are included in Appendix A and B, respectively. Acoustic surveys were completed at 48 sites for a total of 159 detector nights. Some survey sites were surveyed for longer than the proposed 2 detector nights due to inclement weather, equipment malfunction, and not being able to access some of the survey locations due to the search for the escaped convicts in the area. In the case of three survey sites, two detectors were placed in proximity to each other to ensure proper operation of the acoustic equipment. Number of bat calls per detector night varied between the two programs (20.3 for BCID; 38.9 for Kaleidoscope; Table 2). While Kaleidoscope identified more files as bat calls, BCID identified a slightly higher percentage of the calls. BCID recognized 3,034 bat call files and identified 2,961 files to species (98%), while Kaleidoscope recognized 6,445 bat call files and identified 6,243 files to species (97%) (Tables 2 and 3).

Automated acoustic ID software identified potential NLEB at two sites. NLEB calls from were confirmed by qualitative analysis at 2 of 48 acoustic survey sites (4.2%). Based on these data, NLEB are considered to be present at two sites and likely absent at 46 sites. Sites with confirmed NLEB acoustic positives are: JR-13 and JR-38. Follow-up mist-netting was conducted at both JR-13 and JR-38.

### Mist-Net Surveys

Mist-net surveys were completed at two sites between August 6 and August 9, 2015 (Tables 4 and 5). Maps and pictures of mist-net sites are included in Appendix A and C, respectively. A total of five bats at two sites were captured, including two big brown bats (*Eptesicus fuscus*) at net site JR-38, and three little brown bats (*Myotis lucifugus*) at net site JR-13 (Table 5). No NLEB were captured during the 2015 mist-net surveys. Photos of captured bat species are included in Appendix D, and capture details for all bats can be found in Appendix E.

## CONCLUSION

To meet the objectives of the study acoustic surveys were conducted to determine presence/probably absence of NLEB and to determine the locations of follow-up mist-netting surveys. Based on the acoustic results it was determined that there was summer presence of NLEB at sites JR-13 and JR-38. Follow-up mist-netting surveys at those sites resulted in no captures of NLEB.



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## TABLES

**Table 1. Location and site description of 2015 acoustic survey sites at the Jericho Rise Wind Farm**

Site ID	UTM Zone	Easting	Northing	Site Description
JR-1	18	568842	4967582	forested corridor
JR-2	18	569558	4967055	forest edge in grassy field
JR-3	18	570017	4966817	forest edge in grassy field
JR-4	18	569900	4967508	forested corridor
JR-5	18	570694	4967646	forest edge in grassy field
JR-6	18	571085	4967818	forest edge in grassy field
JR-7	18	571602	4967705	forest edge in grassy field
JR-8	18	571045	4968489	forest edge in agriculture field
JR-9	18	571027	4968780	forested corridor
JR-10	18	571004	4968979	forest opening
JR-11	18	571084	4969449	forest opening
JR-12	18	570404	4969867	forest edge in grassy field
JR-13	18	570195	4970224	forest edge in agriculture field
JR-14	18	570463	4970347	forest edge in agriculture field
JR-15	18	570025	4970580	forest opening in grassy field
JR-16	18	569527	4967488	forest edge in grassy field
JR-17	18	569885	4971275	forest opening
JR-18	18	569448	4971640	forested corridor
JR-19	18	569248	4972245	forested corridor
JR-20	18	569432	4972151	forested corridor
JR-21	18	569157	4972859	forest edge in grassy field
JR-22	18	569272	4973275	forest edge in grassy field
JR-23	18	569764	4971989	forest edge in grassy field
JR-24	18	570775	4970988	forest edge in grassy field
JR-25	18	571214	4971190	forest opening in grassy field
JR-26	18	572160	4971177	forest opening
JR-27	18	571271	4969623	forest opening
JR-28	18	573350	4967243	forested corridor
JR-29	18	573501	4968356	forest opening
JR-30	18	572604	4968002	forest edge in grassy field
JR-31	18	572360	4968541	forest opening in grassy field
JR-32	18	572222	4969057	forested corridor
JR-33	18	572498	4969322	forest opening in grassy field
JR-34	18	573276	4969253	forest edge in grassy field
JR-35	18	573679	4969166	forested corridor
JR-36	18	573276	4969249	forest opening in grassy field
JR-37	18	572364	4969673	forest opening
JR-38	18	571889	4969745	forest edge in grassy field
JR-39	18	571726	4970758	forested corridor
JR-40	18	572250	4970965	forested corridor
JR-41	18	571739	4971432	forest edge/corridor
JR-42	18	571552	4971799	forest edge/shelterbelt
JR-43	18	571455	4972215	forest edge in grassy field
JR-44	18	570842	4972627	forest edge/corridor
JR-45	18	570454	4973085	forest edge/shelterbelt
JR-46	18	569054	4973782	forest edge in grassy field
JR-47	18	568887	4973132	forest edge in agriculture field
JR-48	18	569708	4970885	forest opening

**Table 2. Number of bat calls identified by BCID and Kaleidoscope during 2015 northern long-eared bat surveys at the Jericho Rise Wind Farm.**

<b>Survey Site</b>	<b>ID Program</b>	<b>Total Bat Calls</b>	<b>Calls Identified</b>	<b>Detector-Nights</b>	<b>Bat Calls/ Detector-Night</b>
JR-1	BCID	5	5	5	1.00
JR-1	Kaleidoscope	11	9	5	2.20
JR-2	BCID	35	35	5	7.00
JR-2	Kaleidoscope	73	67	5	14.60
JR-3	BCID	445	437	5	89.00
JR-3	Kaleidoscope	1453	1442	5	290.60
JR-4	BCID	16	15	4	4.00
JR-4	Kaleidoscope	22	22	4	5.50
JR-5	BCID	237	230	4	59.25
JR-5	Kaleidoscope	422	405	4	105.50
JR-6	BCID	3	3	3	1.00
JR-6	Kaleidoscope	29	27	3	9.67
JR-7	BCID	6	4	3	2.00
JR-7	Kaleidoscope	11	11	3	3.67
JR-8	BCID	32	30	2	16.00
JR-8	Kaleidoscope	206	205	2	103.00
JR-9	BCID	11	10	3	3.67
JR-9	Kaleidoscope	26	25	3	8.67
JR-10	BCID	22	22	3	7.33
JR-10	Kaleidoscope	29	26	3	9.67
JR-11A	BCID	55	54	5	11.00
JR-11A	Kaleidoscope	87	81	5	17.40
JR-11B	BCID	36	36	4	9.00
JR-11B	Kaleidoscope	62	55	4	15.50
JR-12	BCID	17	16	2	8.50
JR-12	Kaleidoscope	51	48	2	25.50
JR-13	BCID	109	97	6	18.17
JR-13	Kaleidoscope	173	165	6	28.83
JR-14	BCID	260	247	2	130.00
JR-14	Kaleidoscope	376	366	2	188.00
JR-15	BCID	16	16	3	5.33
JR-15	Kaleidoscope	26	25	3	8.67
JR-16	BCID	17	17	3	5.67
JR-16	Kaleidoscope	40	40	3	13.33
JR-17	BCID	18	17	3	6.00
JR-17	Kaleidoscope	28	26	3	9.33
JR-18	BCID	238	235	3	79.33
JR-18	Kaleidoscope	284	280	3	94.67
JR-19	BCID	14	13	2	7.00
JR-19	Kaleidoscope	21	20	2	10.50
JR-20	BCID	43	43	3	14.33
JR-20	Kaleidoscope	87	87	3	29.00
JR-21	BCID	3	3	2	1.50
JR-21	Kaleidoscope	9	7	2	4.50
JR-22	BCID	8	8	2	4.00
JR-22	Kaleidoscope	16	13	2	8.00
JR-23	BCID	45	45	2	22.50
JR-23	Kaleidoscope	81	76	2	40.50

**Table 2. Number of bat calls identified by BCID and Kaleidoscope during 2015 northern long-eared bat surveys at the Jericho Rise Wind Farm.**

Survey Site	ID Program	Total Bat Calls	Calls Identified	Detector-Nights	Bat Calls/Detector-Night
JR-24	BCID	21	21	2	10.50
JR-24	Kaleidoscope	38	38	2	19.00
JR-25	BCID	12	11	2	6.00
JR-25	Kaleidoscope	19	19	2	9.50
JR-26	BCID	16	16	2	8.00
JR-26	Kaleidoscope	26	25	2	13.00
JR-27	BCID	6	6	2	3.00
JR-27	Kaleidoscope	15	15	2	7.50
JR-28	BCID	60	58	2	30.00
JR-28	Kaleidoscope	254	230	2	127.00
JR-29	BCID	57	55	2	28.50
JR-29	Kaleidoscope	78	75	2	39.00
JR-30	BCID	14	14	2	7.00
JR-30	Kaleidoscope	18	17	2	9.00
JR-31	BCID	177	177	2	88.50
JR-31	Kaleidoscope	189	187	2	94.50
JR-32	BCID	6	6	2	3.00
JR-32	Kaleidoscope	8	7	2	4.00
JR-33	BCID	25	23	2	12.50
JR-33	Kaleidoscope	36	34	2	18.00
JR-34	BCID	57	55	8	7.13
JR-34	Kaleidoscope	277	273	8	34.63
JR-35	BCID	19	19	5	3.80
JR-35	Kaleidoscope	30	26	5	6.00
JR-36	BCID	173	170	9	19.22
JR-36	Kaleidoscope	655	640	9	72.78
JR-37	BCID	12	11	2	6.00
JR-37	Kaleidoscope	15	15	2	7.50
JR-38	BCID	106	105	4	26.50
JR-38	Kaleidoscope	228	220	4	57.00
JR-39	BCID	15	15	2	7.50
JR-39	Kaleidoscope	30	28	2	15.00
JR-40	BCID	27	26	2	13.50
JR-40	Kaleidoscope	36	35	2	18.00
JR-41	BCID	4	4	2	2.00
JR-41	Kaleidoscope	9	9	2	4.50
JR-42A	BCID	39	39	6	6.50
JR-42A	Kaleidoscope	63	59	6	10.50
JR-42B	BCID	44	42	4	11.00
JR-42B	Kaleidoscope	65	58	4	16.25
JR-43	BCID	21	21	3	7.00
JR-43	Kaleidoscope	45	39	3	15.00
JR-44	BCID	5	5	2	2.50
JR-44	Kaleidoscope	10	10	2	5.00
JR-45	BCID	18	18	3	6.00
JR-45	Kaleidoscope	38	37	3	12.67
JR-46	BCID	3	3	2	1.50
JR-46	Kaleidoscope	16	13	2	8.00

**Table 2. Number of bat calls identified by BCID and Kaleidoscope during 2015 northern long-eared bat surveys at the Jericho Rise Wind Farm.**

<b>Survey Site</b>	<b>ID Program</b>	<b>Total Bat Calls</b>	<b>Calls Identified</b>	<b>Detector-Nights</b>	<b>Bat Calls/ Detector-Night</b>
JR-47	BCID	328	325	2	164.00
JR-47	Kaleidoscope	378	371	2	189.00
JR-48A	BCID	18	18	2	9.00
JR-48A	Kaleidoscope	38	34	2	19.00
JR-48B	BCID	60	60	2	30.00
JR-48B	Kaleidoscope	208	201	2	104.00

**Table 3. Species identified by BCID and Kaleidoscope during 2015 northern long-eared bat surveys at the Jericho Rise Wind Farm.**

**BBBA=Big Brown Bat; SHBA=Silver-haired Bat; ERBA=Eastern Red Bat; HOBA=Hoary Bat; ESBA=Eastern Small-footed bat; LBBA=Little Brown Bat; NLEB=Northern Long-eared Bat; INBA=Indiana Bat; TRBA=tri-colored bat; UNK=Unknown.**

Site ID	ID Program	BBBA	SHBA	ERBA	HOBA	ESBA	LBBA	NLEB	INBA	TRBA	UNK	Total
JR-1	BCID	3	2	0	0	0	0	0	0	0	0	5
JR-1	Kaleidoscope	4	2	0	3	0	0	0	0	0	2	11
JR-2	BCID	6	13	2	6	0	7	1	0	0	0	35
JR-2	Kaleidoscope	14	16	7	25	1	4	0	0	0	6	73
JR-3	BCID	43	28	12	323	0	21	6	0	4	8	445
JR-3	Kaleidoscope	53	34	23	1307	1	24	0	0	0	11	1,453
JR-4	BCID	1	3	4	4	0	3	0	0	0	1	16
JR-4	Kaleidoscope	3	2	5	10	0	2	0	0	0	0	22
JR-5	BCID	45	22	5	40	30	69	18	0	1	7	237
JR-5	Kaleidoscope	45	22	43	190	25	80	0	0	0	17	422
JR-6	BCID	0	0	0	3	0	0	0	0	0	0	3
JR-6	Kaleidoscope	1	1	0	25	0	0	0	0	0	2	29
JR-7	BCID	1	0	0	2	0	1	0	0	0	2	6
JR-7	Kaleidoscope	3	1	0	5	0	2	0	0	0	0	11
JR-8	BCID	2	6	1	19	1	1	0	0	0	2	32
JR-8	Kaleidoscope	7	7	2	187	0	2	0	0	0	1	206
JR-9	BCID	2	2	2	3	0	1	0	0	0	1	11
JR-9	Kaleidoscope	5	3	2	13	0	2	0	0	0	1	26
JR-10	BCID	4	4	3	7	0	4	0	0	0	0	22
JR-10	Kaleidoscope	5	8	2	6	0	5	0	0	0	3	29
JR-11A	BCID	4	4	13	1	1	25	1	0	0	1	50
JR-11A	Kaleidoscope	8	10	24	11	1	27	0	0	0	6	87
JR-11B	BCID	4	3	9	1	0	19	0	0	0	0	36
JR-11B	Kaleidoscope	2	12	15	4	0	22	0	0	0	7	62
JR-12	BCID	1	1	5	4	0	5	0	0	0	1	17
JR-12	Kaleidoscope	3	7	14	18	1	5	0	0	0	3	51
JR-13	BCID	14	9	36	4	1	29	2	0	2	12	109
JR-13	Kaleidoscope	21	25	63	13	1	41	3	0	1	5	173
JR-14	BCID	49	97	13	82	0	6	0	0	0	13	260
JR-14	Kaleidoscope	105	147	27	78	1	8	0	0	0	10	376
JR-15	BCID	5	4	0	2	0	3	2	0	0	0	16
JR-15	Kaleidoscope	12	0	1	8	0	3	1	0	0	1	26
JR-16	BCID	3	3	3	8	0	0	0	0	0	0	17
JR-16	Kaleidoscope	4	6	2	27	0	1	0	0	0	0	40

**Table 3. Species identified by BCID and Kaleidoscope during 2015 northern long-eared bat surveys at the Jericho Rise Wind Farm.**

**BBBA=Big Brown Bat; SHBA=Silver-haired Bat; ERBA=Eastern Red Bat; HOBA=Hoary Bat; ESBA=Eastern Small-footed bat; LBBA=Little Brown Bat; NLEB=Northern Long-eared Bat; INBA=Indiana Bat; TRBA=tri-colored bat; UNK=Unknown.**

Site ID	ID Program	BBBA	SHBA	ERBA	HOBA	ESBA	LBBA	NLEB	INBA	TRBA	UNK	Total
JR-17	BCID	2	4	2	3	0	6	0	0	0	1	18
JR-17	Kaleidoscope	5	5	3	6	0	7	0	0	0	2	28
JR-18	BCID	58	43	1	117	0	15	1	0	0	3	238
JR-18	Kaleidoscope	55	53	5	149	0	18	0	0	0	4	284
JR-19	BCID	6	3	2	0	0	2	1	0	0	0	14
JR-19	Kaleidoscope	8	3	2	4	0	3	0	0	0	1	21
JR-20	BCID	5	5	3	15	0	12	3	0	0	0	43
JR-20	Kaleidoscope	8	8	9	46	2	12	2	0	0	0	87
JR-21	BCID	0	2	1	0	0	0	0	0	0	0	3
JR-21	Kaleidoscope	2	2	1	1	0	1	0	0	0	2	9
JR-22	BCID	1	1	0	4	0	1	0	0	1	0	8
JR-22	Kaleidoscope	3	3	2	4	0	1	0	0	0	3	16
JR-23	BCID	4	1	4	18	0	18	0	0	0	0	45
JR-23	Kaleidoscope	8	3	3	37	0	25	0	0	0	5	81
JR-24	BCID	4	1	3	4	0	8	1	0	0	0	21
JR-24	Kaleidoscope	5	1	4	20	0	8	0	0	0	0	38
JR-25	BCID	1	0	3	1	0	6	0	0	0	1	12
JR-25	Kaleidoscope	2	2	2	2	0	11	0	0	0	0	19
JR-26	BCID	9	3	1	2	0	1	0	0	0	0	16
JR-26	Kaleidoscope	10	6	2	5	0	2	0	0	0	1	26
JR-27	BCID	1	2	0	0	0	3	0	0	0	0	6
JR-27	Kaleidoscope	3	7	0	0	0	5	0	0	0	0	15
JR-28	BCID	18	18	2	17	0	2	0	0	1	2	60
JR-28	Kaleidoscope	32	16	4	176	0	2	0	0	0	24	254
JR-29	BCID	21	3	15	0	2	12	2	0	0	2	57
JR-29	Kaleidoscope	24	7	24	3	0	17	0	0	0	3	78
JR-30	BCID	0	1	2	2	0	9	0	0	0	0	14
JR-30	Kaleidoscope	0	4	2	1	0	10	0	0	0	1	18
JR-31	BCID	66	18	1	91	0	0	1	0	0	0	177
JR-31	Kaleidoscope	60	82	0	42	0	3	0	0	0	2	189
JR-32	BCID	2	2	0	0	0	1	0	0	0	1	6
JR-32	Kaleidoscope	2	2	0	1	0	2	0	0	0	1	8
JR-33	BCID	8	2	3	6	1	2	1	0	0	2	25
JR-33	Kaleidoscope	12	4	5	8	0	4	1	0	0	2	36

**Table 3. Species identified by BCID and Kaleidoscope during 2015 northern long-eared bat surveys at the Jericho Rise Wind Farm.**

**BBBA=Big Brown Bat; SHBA=Silver-haired Bat; ERBA=Eastern Red Bat; HOBA=Hoary Bat; ESBA=Eastern Small-footed bat; LBBA=Little Brown Bat; NLEB=Northern Long-eared Bat; INBA=Indiana Bat; TRBA=tri-colored bat; UNK=Unknown.**

Site ID	ID Program	BBBA	SHBA	ERBA	HOBA	ESBA	LBBA	NLEB	INBA	TRBA	UNK	Total
JR-34	BCID	4	28	5	15	0	3	0	0	0	2	57
JR-34	Kaleidoscope	15	33	8	211	0	6	0	0	0	4	277
JR-35	BCID	10	2	2	0	0	4	1	0	0	0	19
JR-35	Kaleidoscope	9	4	3	3	0	7	0	0	0	4	30
JR-36	BCID	26	65	4	59	0	16	0	0	0	3	173
JR-36	Kaleidoscope	34	69	13	510	0	13	1	0	0	15	655
JR-37	BCID	4	3	0	2	0	2	0	0	0	1	12
JR-37	Kaleidoscope	5	6	1	2	0	1	0	0	0	0	15
JR-38	BCID	26	11	23	18	0	25	0	0	2	1	106
JR-38	Kaleidoscope	26	16	46	99	0	32	1	0	0	8	228
JR-39	BCID	3	4	0	2	0	6	0	0	0	0	15
JR-39	Kaleidoscope	7	3	3	9	0	6	0	0	0	2	30
JR-40	BCID	12	8	1	3	0	2	0	0	0	1	27
JR-40	Kaleidoscope	20	8	2	4	0	1	0	0	0	1	36
JR-41	BCID	0	3	0	0	0	1	0	0	0	0	4
JR-41	Kaleidoscope	2	3	1	3	0	0	0	0	0	0	9
JR-42A	BCID	3	3	3	1	0	27	1	0	1	1	40
JR-42A	Kaleidoscope	7	7	11	3	1	30	0	0	0	4	63
JR-42B	BCID	4	1	3	0	4	22	8	0	0	1	43
JR-42B	Kaleidoscope	3	7	9	4	1	32	2	0	0	7	65
JR-43	BCID	5	4	2	7	0	3	0	0	0	0	21
JR-43	Kaleidoscope	8	5	1	20	0	5	0	0	0	6	45
JR-44	BCID	3	1	1	0	0	0	0	0	0	0	5
JR-44	Kaleidoscope	3	1	1	5	0	0	0	0	0	0	10
JR-45	BCID	7	3	1	2	0	2	0	0	3	0	18
JR-45	Kaleidoscope	15	4	8	8	0	2	0	0	0	1	38
JR-46	BCID	0	1	0	0	0	1	1	0	0	0	3
JR-46	Kaleidoscope	1	7	1	2	0	2	0	0	0	3	16
JR-47	BCID	209	66	7	36	0	6	0	0	1	3	328
JR-47	Kaleidoscope	265	46	10	43	0	7	0	0	0	7	378
JR-48A	BCID	1	2	0	12	0	3	0	0	0	0	18
JR-48A	Kaleidoscope	1	2	0	28	0	3	0	0	0	4	38
JR-48B	BCID	6	18	0	35	0	1	0	0	0	0	60
JR-48B	Kaleidoscope	12	31	1	156	0	1	0	0	0	7	208



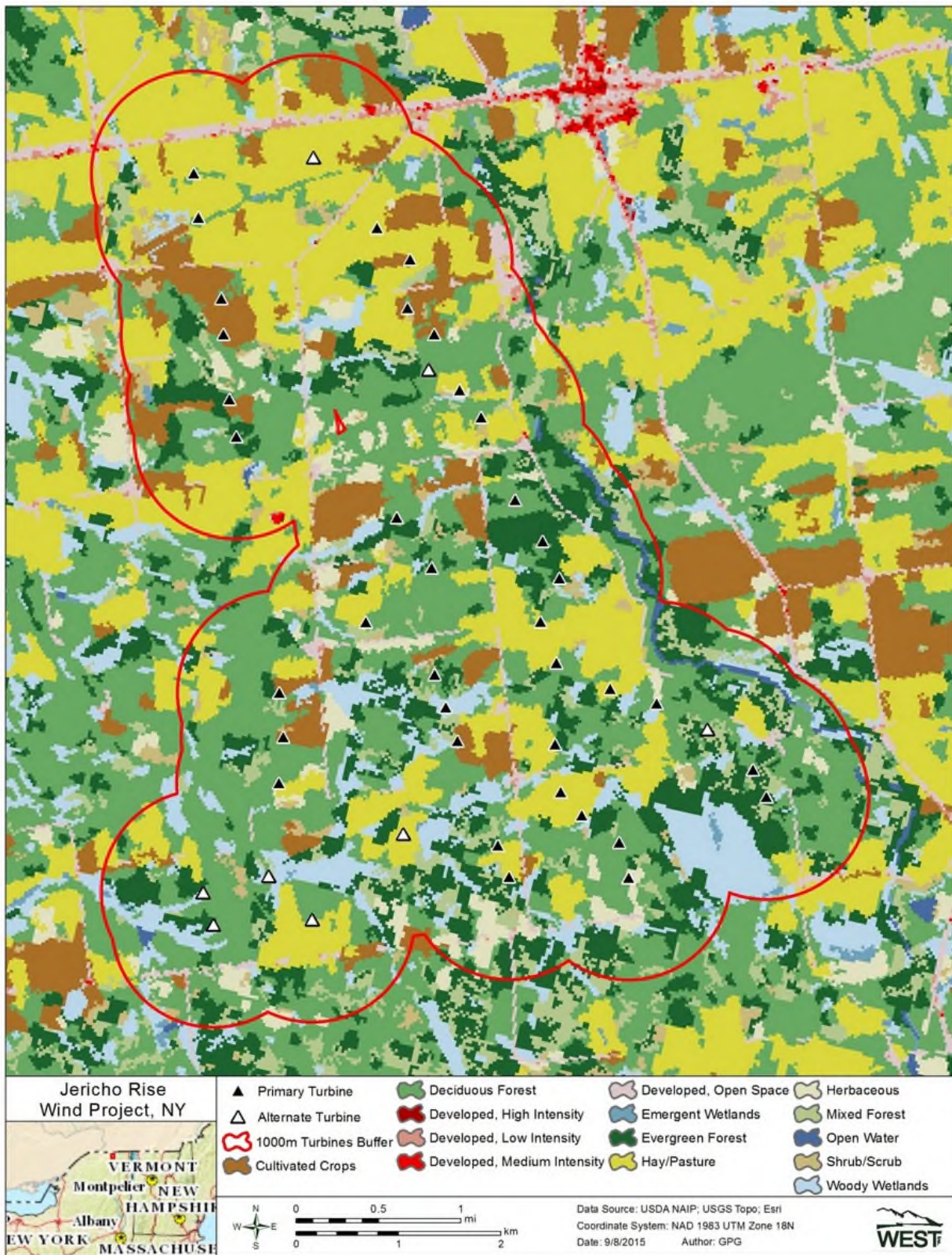
**Table 4. Location and site description of mist-net sites for the 2015 northern long-eared bat surveys at the Jericho Rise Wind Farm.**

Site ID	Net	UTM		Site Description
JR-13	A	570176	4970235	forested corridor along two-track
	B	570134	4970062	forest edge/corridor
JR-38	A	571806	4969738	forest edge in grassy field
	B	571861	4969732	forest opening/corridor

**Table 5. Summary of bat captures at mist-net sites for the 2015 northern long-eared bat surveys at the Jericho Rise Wind Farm.**

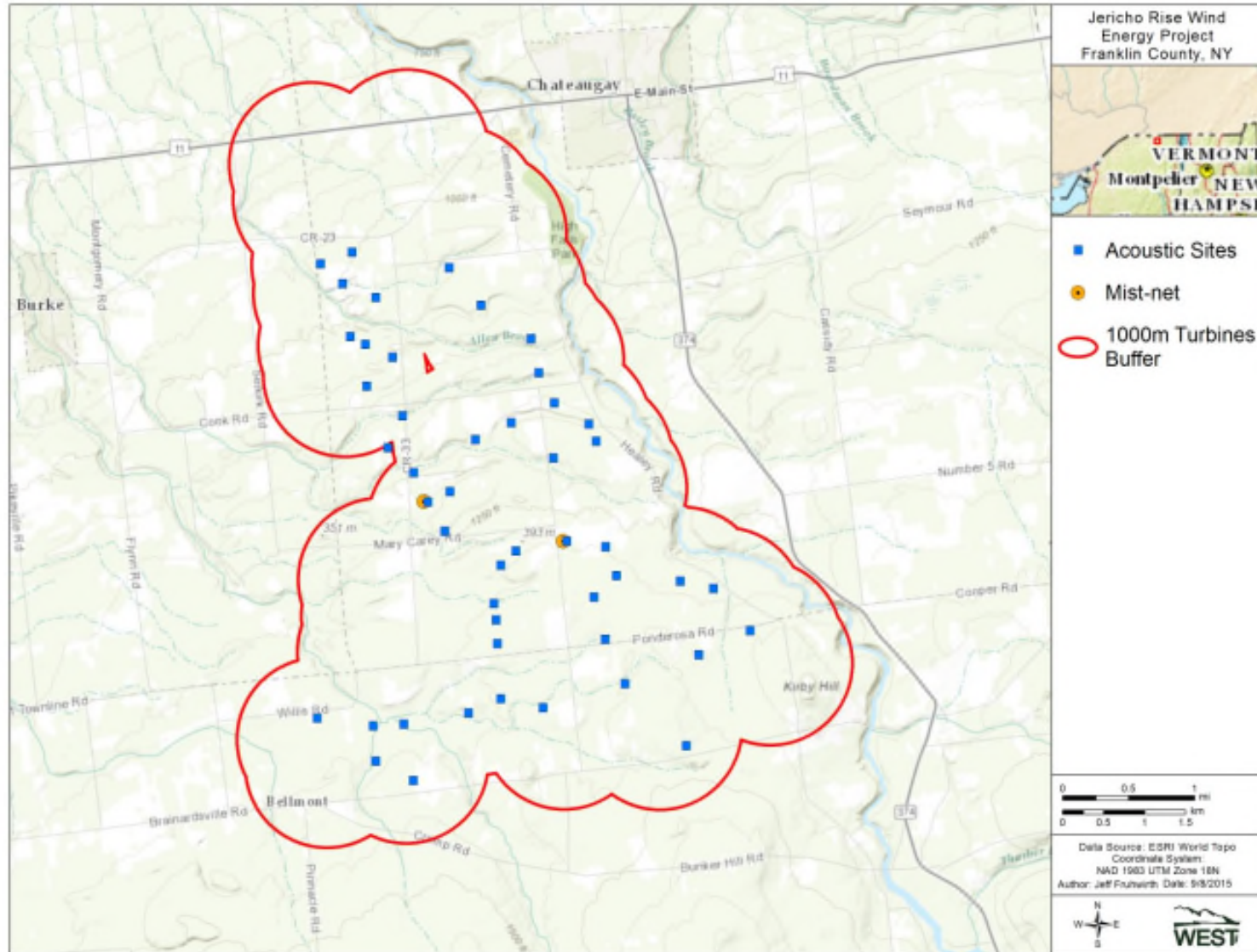
<b>Site</b>	<b>Big Brown Bat</b>	<b>Eastern Red Bat</b>	<b>Hoary Bat</b>	<b>Silver-Haired Bat</b>	<b>Little Brown Bat</b>	<b>Northern Long-Eared Bat</b>	<b>Unknown</b>	<b>Total</b>
JR-13	0	0	0	0	3	0	0	3
JR-38	2	0	0	0	0	0	0	2
<b>Total</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>5</b>

## **Appendix A. Maps of Northern Long-Eared Bat Surveys**

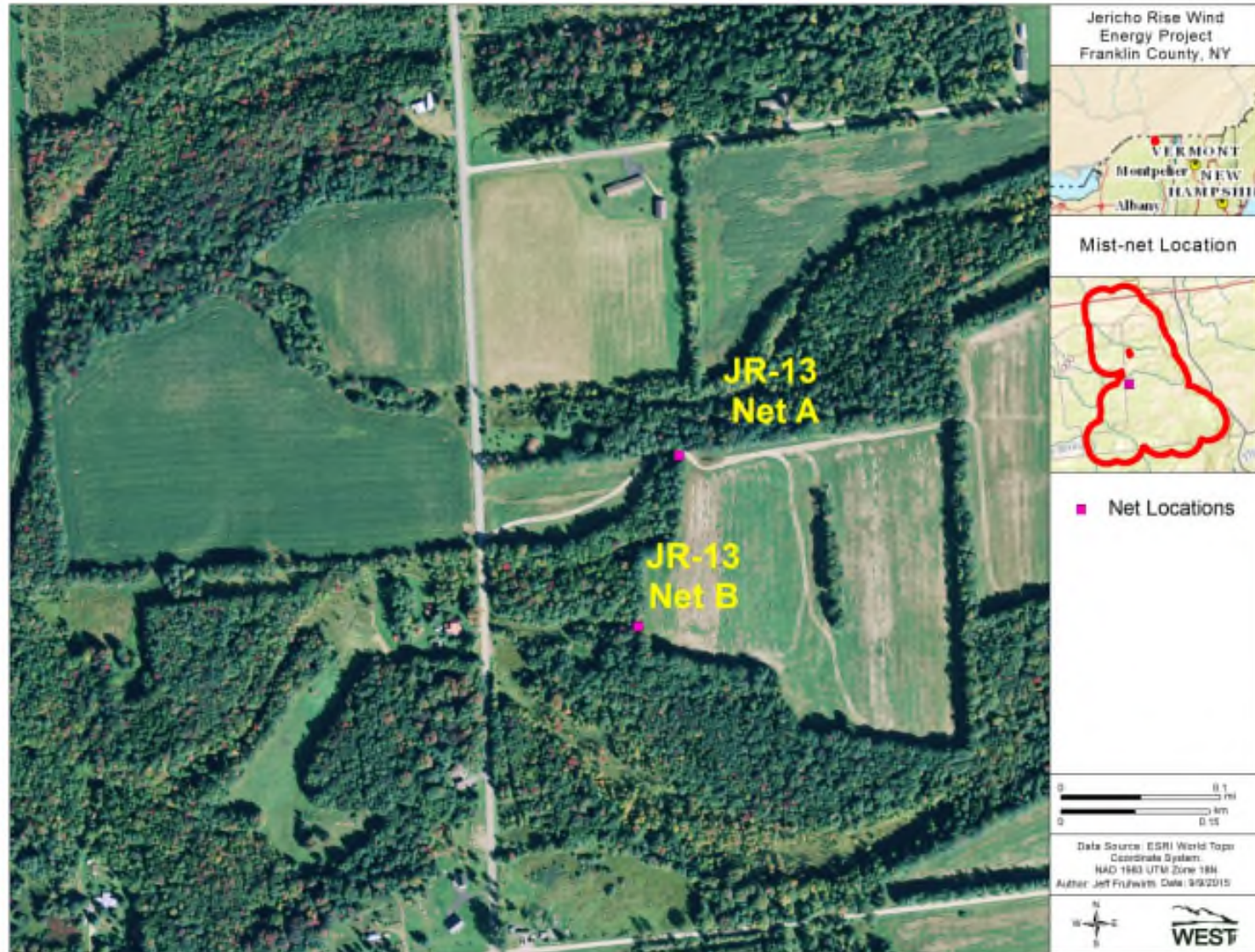


**Appendix A1. Land use and land cover at the Jericho Rise Wind Farm.**



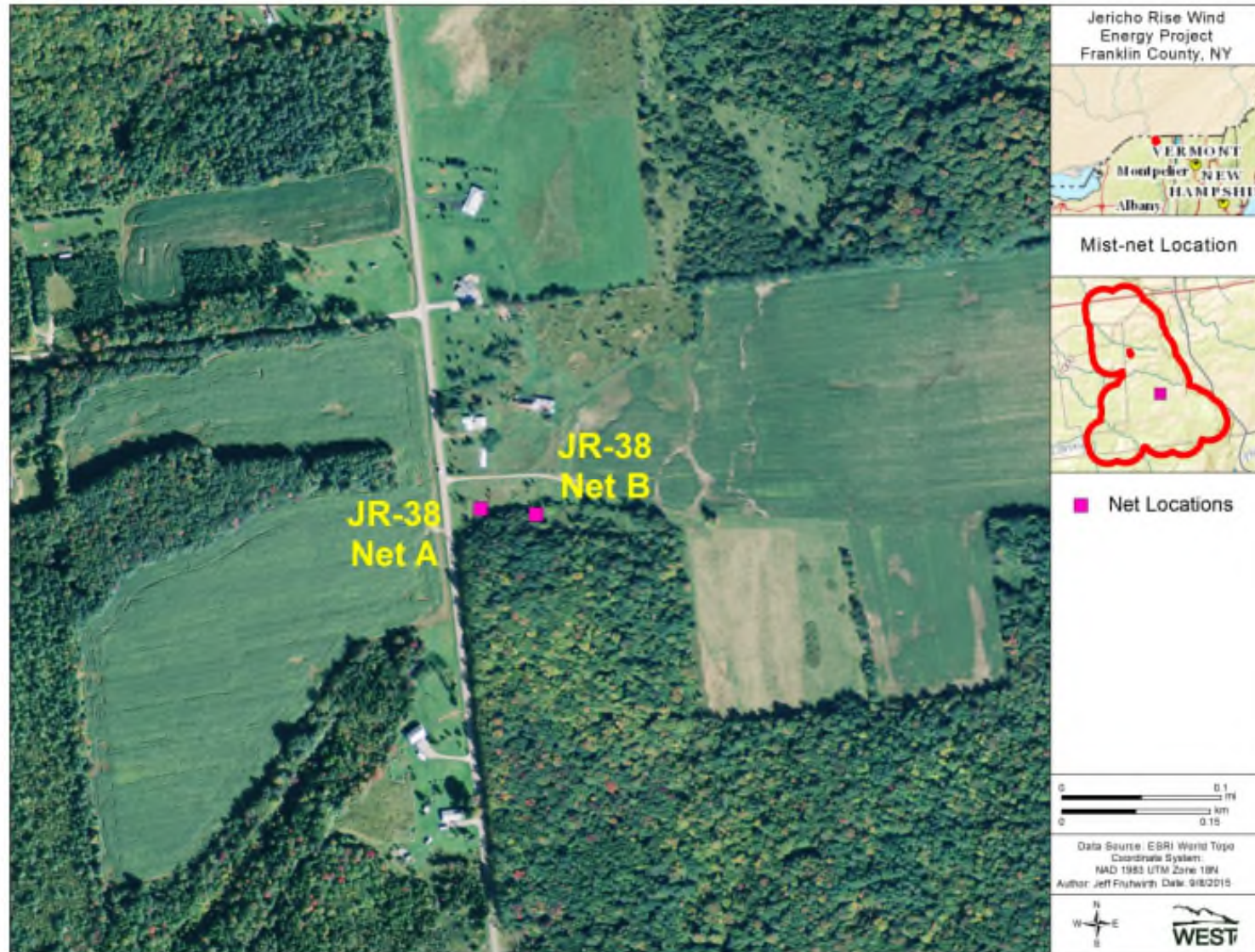


**Appendix A2. Northern long-eared bat acoustic and mist-net survey locations at the Jericho Rise Wind Farm.**



Appendix A3. Close up map of mist-net site JR-13 at the Jericho Rise Wind Farm.





Appendix A4. Close-up map of mist-net site JR-38 at the Jericho Rise Wind Farm.

## **Appendix B. Photographs of Acoustic Survey Sites**





**Appendix B. Acoustic survey site JR-1.**



**Appendix B. Acoustic survey site JR-2.**



**Appendix B. Acoustic survey site JR-3.**



**Appendix B. Acoustic survey site JR-4.**





**Appendix B. Acoustic survey site JR-5.**



**Appendix B. Acoustic survey site JR-6.**



**Appendix B. Acoustic survey site JR-7.**



**Appendix B. Acoustic survey site JR-8.**





**Appendix B. Acoustic survey site JR-9.**



**Appendix B. Acoustic survey site JR-10.**





**Appendix B. Acoustic survey site JR-11.**



**Appendix B. Acoustic survey site JR-12.**



**Appendix B. Acoustic survey site JR-13.**





**Appendix B. Acoustic survey site JR-14.**



**Appendix B. Acoustic survey site JR-15.**



**Appendix B. Acoustic survey site JR-16.**





**Appendix B. Acoustic survey site JR-17.**



**Appendix B. Acoustic survey site JR-18.**



**Appendix B. Acoustic survey site JR-19.**





**Appendix B. Acoustic survey site JR-20.**



**Appendix B. Acoustic survey site JR-21.**





**Appendix B. Acoustic survey site JR-22.**



**Appendix B. Acoustic survey site JR-23.**



**Appendix B. Acoustic survey site JR-24.**





**Appendix B. Acoustic survey site JR-25.**



**Appendix B. Acoustic survey site JR-26.**





**Appendix B. Acoustic survey site JR-27.**



**Appendix B. Acoustic survey site JR-28.**



**Appendix B. Acoustic survey site JR-29.**





**Appendix B. Acoustic survey site JR-30.**



**Appendix B. Acoustic survey site JR-31.**





**Appendix B. Acoustic survey site JR-32.**

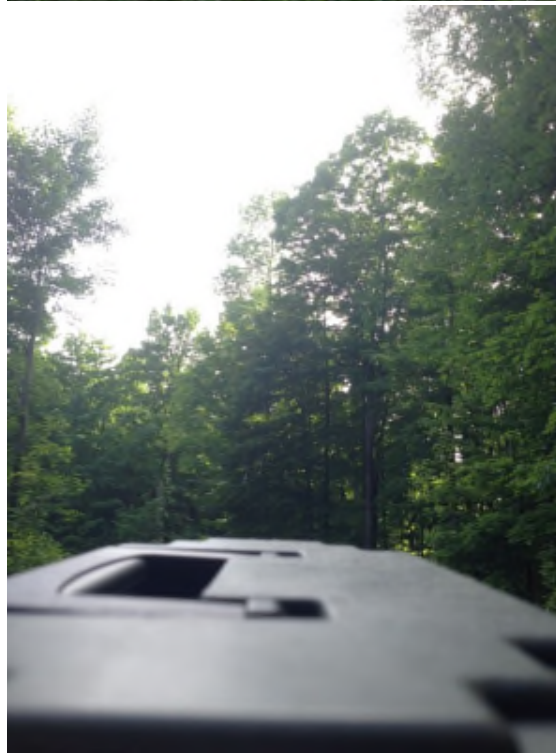


**Appendix B. Acoustic survey site JR-33.**



**Appendix B. Acoustic survey site JR-34.**





**Appendix B. Acoustic survey site JR-35.**



**Appendix B. Acoustic survey site JR-36.**





**Appendix B. Acoustic survey site JR-37.**



**Appendix B. Acoustic survey site JR-38.**



**Appendix B. Acoustic survey site JR-39.**





**Appendix B. Acoustic survey site JR-40.**



**Appendix B. Acoustic survey site JR-41.**





**Appendix B. Acoustic survey site JR-42.**



**Appendix B. Acoustic survey site JR-43.**



**Appendix B. Acoustic survey site JR-44.**



**Appendix B. Acoustic survey site JR-45.**





**Appendix B. Acoustic survey site JR-46.**



**Appendix B. Acoustic survey site JR-47.**



**Appendix B. Acoustic survey site JR-48.**

## **Appendix C. Photographs of Mist-Net Survey Sites**





**Appendix C1. Bat habitat surveyed by mist-nets at JR-13 net A.**



**Appendix C1. Bat habitat surveyed by mist-nets at JR-13 net B.**



**Appendix C1. Bat habitat surveyed by mist-nets at JR-38 net A**





**Appendix C1. Bat habitat surveyed by mist-nets at JR-38 net B**



## **Appendix D. Photographs of Captured Bats**



**Appendix D1. Big brown bat**



**Appendix D2. Little brown bat**

## **Appendix E. Summary of Mist-Net Captures**



**Appendix E1. Details of bats captured at mist-net site JR-13; August 6 and 7, 2015.**

<b>Species</b>	<b>Sex</b>	<b>Age</b>	<b>Reproductive Status</b>	<b>Reichard Score</b>	<b>Weight (g)</b>	<b>Forearm Length (mm)</b>
<b>August 6</b>						
Little brown bat	Female	Adult	Post-lactating	0	8.0	38.1
Little brown bat	Male	Adult	Non-reproductive	0	7.5	38.7
Little brown bat	Female	Juvenile	Non-reproductive	0	7.5	37.5
<b>August 7</b>						
None						

**Appendix E2. Details of bats captured at mist-net site JR-38; August 8 and 9, 2015.**

<b>Species</b>	<b>Sex</b>	<b>Age</b>	<b>Reproductive Status</b>	<b>Reichard Score</b>	<b>Weight (g)</b>	<b>Forearm Length (mm)</b>
<b>August 8</b>						
None						
<b>August 9</b>						
Big brown bat	Female	Adult	Post-lactating	0	1625	45.0
Big brown bat	Female	Adult	Post-lactating	0	16.0	44.1