

**ARKWRIGHT SUMMIT WIND FARM ACOUSTIC AND MIST-
NET BAT SURVEY REPORT
CHAUTAUQUA COUNTY, NEW YORK**

June 22 – August 16, 2015



Prepared for:

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EXECUTIVE SUMMARY

EDP Renewables North America is developing of the Arkwright Summit Wind Farm (Project) in Chautauqua 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 NLEB should be conducted.

Following the 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. US Fish and Wildlife Service defines suitable habitat for 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 in New York required 35 survey locations (27 of which were located within the Project and eight along the proposed transmission line route). 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 one of the 35 acoustic sites.

Based on habitat assessment and US Fish and Wildlife Service recommendations, bat surveys were conducted at 36 sites. Acoustic presence/probable absence surveys were conducted at 35 sites with sampling occurring during 103 detector nights. NLEB echolocation calls were identified at one of the 35 acoustic sites. Follow up mist-net surveys were conducted at the one positive acoustic site in order to capture NLEB, and potentially conduct telemetry surveys, and locate roost trees used by this species if possible. Bat survey methods and the survey locations were provided to the US Fish and Wildlife Service. Qualitative review confirmed NLEB at one site (2.9%). NLEB are considered to be likely absent from 34 of 35 sites (97.1%).

Mist-net surveys were completed at the site on August 11 and August 12, 2015. A total of three bats (two eastern reds and one big brown bat) were capture. 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 Arkwright Summit Wind Farm (Project) in Chautauqua County, New York. In 2015, EDPR contracted Western Ecosystems Technology, Inc. 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 NLEB in areas potentially affected by construction activity and operation of the facility; and 2) determine sites where follow-up mist-netting for NLEB should be conducted.

Following the 2015 Indiana Bat summer survey guidance, the level of effort for acoustic surveys is determined as one survey station within each approximate 1-km segment containing suitable forest habitat blocks along linear survey area. USFWS (2015) defines suitable habitat for 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 in New York required 35 survey locations (27 of which were located within the Project and eight along the proposed transmission line route; 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 one of the 35 acoustic sites (Appendices A2 and A3).

Based on habitat assessment and US Fish and Wildlife Service (USFWS) recommendations, bat surveys were conducted at 35 sites. Prior to surveys being bat survey methods and the survey locations were provided to the USFWS. Acoustic presence/probable absence surveys were conducted at 35 sites (Appendix A2). NLEB echolocation calls were identified at one of the 35 acoustic sites. Follow up mist-net surveys were conducted at the one positive acoustic site in order to capture NLEB, and potentially 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 11 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 under the ESA. 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 22 through August 16; 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/>): Dunkirk, 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. WEST surveyed two mist-net locations per site. 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, 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.

RESULTS

Acoustic Surveys

WEST conducted acoustic surveys from June 22 - 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 35 sites for a total of 103 detector nights. Some survey sites were surveyed for longer than the proposed 2 detector nights due to inclement weather, equipment malfunction, or scheduled

access to survey sites. At one survey site (AW-3), 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 (51.8 for BCID; 75 for Kaleidoscope; Table 2). While Kaleidoscope identified more files as bat calls, BCID identified a slightly higher percentage of the calls. BCID recognized 5,340 bat call files and identified 5,270 files to species (99%), while Kaleidoscope recognized 7,723 bat call files and identified 7,333 files to species (95%) (Tables 2 and 3).

Automated acoustic ID software identified potential NLEB at one site. NLEB calls from were confirmed by qualitative analysis at one of 35 acoustic survey sites (2.9%). Based on these data, NLEB are considered to be present at one site and likely absent at 34 sites (97.1%). The site with confirmed NLEB acoustic positives is: AW-26. Follow-up mist-netting was conducted at AW-26.

Mist-Net Surveys

Mist-net surveys were completed at one site on August 11 and August 12, 2015 (Tables 4 and 5). Maps and pictures of mist-net sites are included in Appendix A and C, respectively. A total of three bats were captured at the site, including two eastern red bats and one big brown bat (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 site AW-26. Follow-up mist-netting surveys at the site resulted in no captures of NLEB.

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TABLES

Table 1. Location and site description of 2015 acoustic survey sites at the Arkwright Summit Wind Farm.

Site ID	UTM Zone	Easting	Northing	Site Description
AW-1	17	648287	4693599	forest corridor
AW-2	17	647551	4693692	forest corridor
AW-3	17	646705	4693773	forest corridor
AW-4	17	646617	4699388	forest corridor
AW-5	17	645994	4694863	forest edge
AW-6	17	646989	4695049	forest opening
AW-7	17	645944	4695292	forest edge
AW-8	17	644833	4694983	forest edge
AW-9	17	643940	4696882	forest edge
AW-10	17	644345	4697496	forest corridor
AW-11	17	644833	4697785	forest corridor
AW-12	17	645484	4697458	forest corridor
AW-13	17	645471	4697064	forest opening
AW-14	17	645512	4697684	forest corridor
AW-15	17	646693	4696560	forest opening
AW-16	17	644213	4697740	forest corridor
AW-17	17	644333	4698024	forest opening
AW-18	17	643033	4699027	forest edge
AW-19	17	643321	4699093	forest corridor
AW-20	17	643640	4698882	forest opening
AW-21	17	644972	4698709	forest edge
AW-22	17	645483	4698931	forest edge
AW-23	17	643362	4698883	forest edge
AW-24	17	644892	4695841	forest edge
AW-25	17	646020	4694425	forest corridor
AW-26	17	644756	4697848	forest edge
AW-27	17	644948	4698440	forest opening
AW-T1	17	640014	4697379	forest edge
AW-T2	17	640147	4696602	forest corridor
AW-T3	17	640770	4695959	forest edge
AW-T4	17	641369	4695917	forest edge
AW-T5	17	642334	4696090	forest corridor
AW-T6	17	642731	4696562	forest edge
AW-T7	17	643505	4697443	forest edge
AW-T8	17	644061	4697534	forest edge

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

Survey Site	ID Program	Total Bat Calls	Calls Identified	Detector-Nights	Bat Calls/ Detector-Night
AW-1	BCID	570	558	3	190
AW-1	Kaleidoscope	687	664	3	229
AW-2	BCID	229	229	3	76.33
AW-2	Kaleidoscope	267	254	3	89
AW-3	BCID	11	11	3	3.67
AW-3	Kaleidoscope	24	19	3	8
AW-4	BCID	22	22	3	7.33
AW-4	Kaleidoscope	43	43	3	14.33
AW-5	BCID	26	26	3	8.67
AW-5	Kaleidoscope	71	63	3	23.67
AW-6	BCID	32	30	3	10.67
AW-6	Kaleidoscope	61	52	3	20.33
AW-7	BCID	72	72	3	24
AW-7	Kaleidoscope	104	97	3	34.67
AW-8	BCID	57	56	3	19
AW-8	Kaleidoscope	93	90	3	31
AW-9	BCID	52	52	3	17.33
AW-9	Kaleidoscope	73	71	3	24.33
AW-10	BCID	1081	1081	3	360.33
AW-10	Kaleidoscope	1104	1093	3	368
AW-11	BCID	37	36	2	18.5
AW-11	Kaleidoscope	45	44	2	22.5
AW-12	BCID	26	25	7	3.71
AW-12	Kaleidoscope	66	57	7	9.43
AW-13	BCID	27	25	2	13.5
AW-13	Kaleidoscope	36	36	2	18
AW-14	BCID	24	23	2	12
AW-14	Kaleidoscope	45	42	2	22.5
AW-15	BCID	283	276	2	141.5
AW-15	Kaleidoscope	328	317	2	164
AW-16	BCID	30	30	3	10
AW-16	Kaleidoscope	75	63	3	25
AW-17	BCID	7	7	2	3.5
AW-17	Kaleidoscope	22	20	2	11
AW-18	BCID	56	55	2	28
AW-18	Kaleidoscope	101	93	3	33.67
AW-19	BCID	10	9	3	3.33
AW-19	Kaleidoscope	32	26	3	10.67
AW-20	BCID	10	10	2	5
AW-20	Kaleidoscope	28	26	2	14
AW-21	BCID	26	26	2	13
AW-21	Kaleidoscope	33	32	2	16.5
AW-22	BCID	61	58	2	30.5
AW-22	Kaleidoscope	90	86	2	45
AW-23	BCID	43	41	2	21.5
AW-23	Kaleidoscope	71	69	2	35.5
AW-24	BCID	79	78	2	39.5
AW-24	Kaleidoscope	138	128	2	69

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

Survey Site	ID Program	Total Bat Calls	Calls Identified	Detector-Nights	Bat Calls/ Detector-Night
AW-25	BCID	2	2	2	1
AW-25	Kaleidoscope	5	5	2	2.5
AW-26	BCID	74	74	3	24.67
AW-26	Kaleidoscope	109	103	3	36.33
AW-27	BCID	25	25	3	8.33
AW-27	Kaleidoscope	41	41	3	13.67
AW-T1	BCID	68	67	3	22.67
AW-T1	Kaleidoscope	200	190	3	66.67
AW-T2	BCID	80	79	3	26.67
AW-T2	Kaleidoscope	139	129	3	46.33
AW-T3A	BCID	440	428	7	62.86
AW-T3A	Kaleidoscope	905	807	7	129.29
AW-T3B	BCID	306	304	4	76.5
AW-T3B	Kaleidoscope	598	550	4	149.5
AW-T4	BCID	359	350	2	179.5
AW-T4	Kaleidoscope	508	478	2	254
AW-T5	BCID	816	810	2	408
AW-T5	Kaleidoscope	1061	1038	2	530.5
AW-T6	BCID	171	167	2	85.5
AW-T6	Kaleidoscope	206	203	2	103
AW-T7	BCID	38	38	2	19
AW-T7	Kaleidoscope	95	92	2	47.5
AW-T8	BCID	48	48	2	24
AW-T8	Kaleidoscope	56	55	2	28
AW-M26 Acoustics	BCID	42	42	3	14
AW-M26 Acoustics	Kaleidoscope	163	157	3	54.33

Table 3. Species identified by BCID and Kaleidoscope during 2015 northern long-eared bat surveys at the Arkwright Summit 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
AW-1	BCID	388	105	20	32	0	0	0	0	13	12	570
AW-1	Kaleidoscope	469	82	81	27	0	3	0	0	2	23	687
AW-2	BCID	161	41	14	3	1	0	0	0	7	2	229
AW-2	Kaleidoscope	180	37	29	3	0	5	0	0	0	13	267
AW-3	BCID	8	1	2	0	0	0	0	0	0	0	11
AW-3	Kaleidoscope	10	1	7	1	0	0	0	0	0	5	24
AW-4	BCID	6	5	1	8	2	0	0	0	0	0	22
AW-4	Kaleidoscope	10	8	6	19	0	0	0	0	0	0	43
AW-5	BCID	19	2	3	0	0	1	0	0	1	0	26
AW-5	Kaleidoscope	17	4	20	20	0	2	0	0	0	8	71
AW-6	BCID	16	5	1	2	5	0	0	0	1	2	32
AW-6	Kaleidoscope	21	4	24	1	0	2	0	0	0	9	61
AW-7	BCID	48	8	10	2	0	1	1	0	2	0	72
AW-7	Kaleidoscope	50	14	22	4	0	5	1	0	1	7	104
AW-8	BCID	10	22	1	17	0	0	2	0	4	1	57
AW-8	Kaleidoscope	35	13	24	14	0	2	1	0	1	3	93
AW-9	BCID	24	4	8	12	1	1	0	0	2	0	52
AW-9	Kaleidoscope	22	8	18	23	0	0	0	0	0	2	73
AW-10	BCID	979	97	2	2	0	0	0	0	1	0	1081
AW-10	Kaleidoscope	1053	30	6	4	0	0	0	0	0	11	1104
AW-11	BCID	26	8	0	2	0	0	0	0	0	1	37
AW-11	Kaleidoscope	31	8	0	5	0	0	0	0	0	1	45
AW-12	BCID	14	2	5	1	2	1	0	0	0	1	26
AW-12	Kaleidoscope	22	5	24	5	0	1	0	0	0	9	66
AW-13	BCID	14	4	4	3	0	0	0	0	0	2	27
AW-13	Kaleidoscope	18	6	9	3	0	0	0	0	0	0	36
AW-14	BCID	9	10	2	2	0	0	0	0	0	1	24
AW-14	Kaleidoscope	14	8	7	13	0	0	0	0	0	3	45
AW-15	BCID	212	8	50	0	2	1	0	0	3	7	283
AW-15	Kaleidoscope	218	22	72	2	1	1	0	0	1	11	328
AW-16	BCID	12	7	7	3	0	0	1	0	0	0	30
AW-16	Kaleidoscope	21	9	27	5	0	1	0	0	0	12	75

Table 3. Species identified by BCID and Kaleidoscope during 2015 northern long-eared bat surveys at the Arkwright Summit 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
AW-17	BCID	3	0	1	3	0	0	0	0	0	0	7
AW-17	Kaleidoscope	5	8	1	6	0	0	0	0	0	2	22
AW-18	BCID	25	5	8	5	2	0	0	0	10	1	56
AW-18	Kaleidoscope	30	3	54	6	0	0	0	0	0	8	101
AW-19	BCID	2	6	0	0	0	1	0	0	0	1	10
AW-19	Kaleidoscope	5	7	3	10	0	1	0	0	0	6	32
AW-20	BCID	6	1	0	2	0	0	0	0	1	0	10
AW-20	Kaleidoscope	6	9	6	5	0	0	0	0	0	2	28
AW-21	BCID	22	3	1	0	0	0	0	0	0	0	26
AW-21	Kaleidoscope	24	5	2	0	0	1	0	0	0	1	33
AW-22	BCID	37	8	4	6	0	0	0	0	3	3	61
AW-22	Kaleidoscope	43	6	24	12	0	1	0	0	0	4	90
AW-23	BCID	12	8	13	5	1	0	0	0	2	2	43
AW-23	Kaleidoscope	11	15	30	13	0	0	0	0	0	2	71
AW-24	BCID	43	19	13	3	0	0	0	0	0	1	79
AW-24	Kaleidoscope	58	11	55	4	0	0	0	0	0	10	138
AW-25	BCID	1	0	0	1	0	0	0	0	0	0	2
AW-25	Kaleidoscope	1	1	1	2	0	0	0	0	0	0	5
AW-26	BCID	35	13	4	20	0	1	1	0	0	0	74
AW-26	Kaleidoscope	49	6	7	39	0	1	1	0	0	6	109
AW-27	BCID	7	17	0	1	0	0	0	0	0	0	25
AW-27	Kaleidoscope	32	6	2	1	0	0	0	0	0	0	41
AW-T1	BCID	4	2	3	58	0	0	0	0	0	1	68
AW-T1	Kaleidoscope	5	13	8	164	0	0	0	0	0	10	200
AW-T2	BCID	0	4	55	4	6	9	0	0	1	1	80
AW-T2	Kaleidoscope	1	5	88	15	2	14	2	0	2	10	139
AW-T3A	BCID	197	74	64	9	30	6	1	0	47	12	440
AW-T3A	Kaleidoscope	275	81	410	23	4	8	0	0	6	98	905
AW-T3B	BCID	169	79	22	11	9	3	1	0	10	2	306
AW-T3B	Kaleidoscope	233	77	217	10	2	9	0	0	2	48	598
AW-T4	BCID	78	78	33	160	0	1	0	0	0	9	359
AW-T4	Kaleidoscope	124	86	85	181	0	1	0	0	1	30	508

Table 3. Species identified by BCID and Kaleidoscope during 2015 northern long-eared bat surveys at the Arkwright Summit 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
AW-T5	BCID	451	139	202	7	0	2	0	0	9	6	816
AW-T5	Kaleidoscope	579	28	370	45	0	2	0	0	14	23	1061
AW-T6	BCID	97	33	18	13	1	1	0	0	4	4	171
AW-T6	Kaleidoscope	132	29	35	6	0	0	1	0	0	3	206
AW-T7	BCID	7	18	7	5	0	0	0	0	1	0	38
AW-T7	Kaleidoscope	11	44	29	7	0	0	0	0	1	3	95
AW-T8	BCID	42	3	1	1	0	0	0	0	1	0	48
AW-T8	Kaleidoscope	46	4	4	1	0	0	0	0	0	1	56
AW-M26 Acoustics	BCID	20	7	5	4	0	1	0	0	5	0	42
AW-M26 Acoustics	Kaleidoscope	25	10	25	96	0	1	0	0	0	6	163

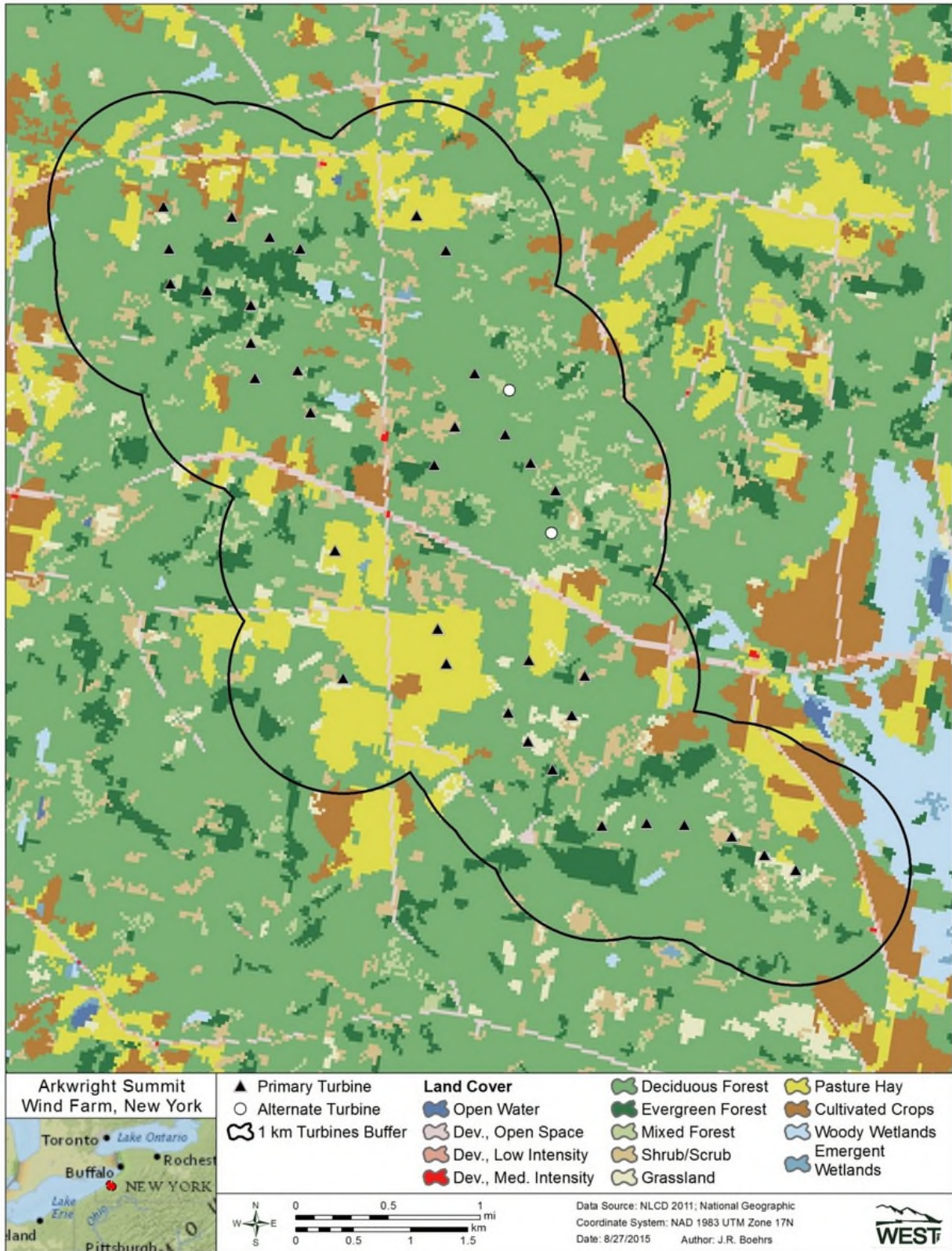
Table 4. Location and site description of mist-net sites for the 2015 northern long-eared bat surveys at the Arkwright Summit Wind Farm.

Site ID	Net	UTM		Site Description
AW-26	A	644791	4697339	forested edge/corridor
	B	644730	4697358	forest opening

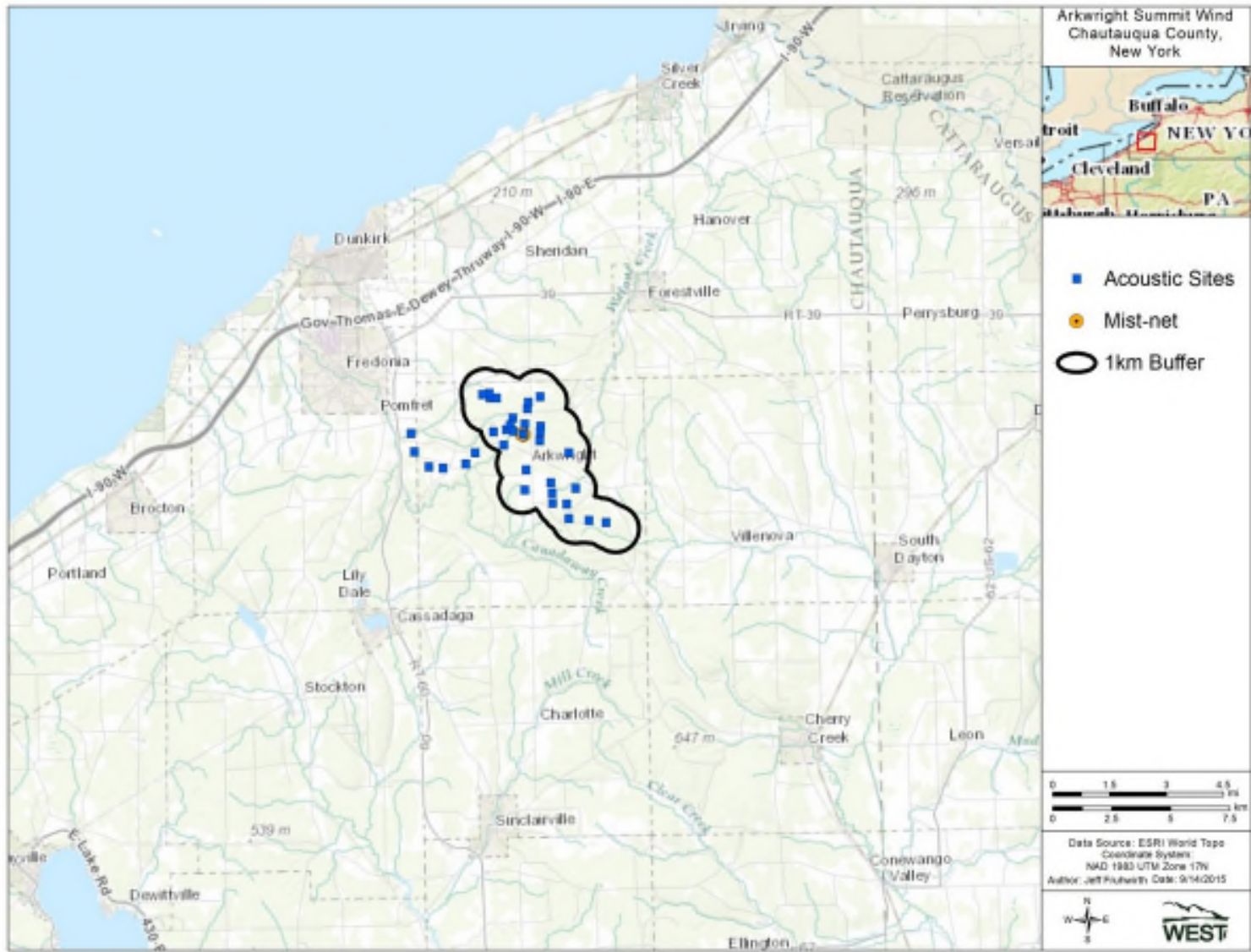
Table 5. Summary of bat captures at mist-net sites for the 2015 northern long-eared bat surveys at the Arkwright Summit Wind Farm.

Site	Big Brown Bat	Eastern Red Bat	Hoary Bat	Silver-Haired Bat	Little Brown Bat	Northern Long-Eared Bat	Unknown	Total
AW-26	1	2	0	0	0	0	0	3

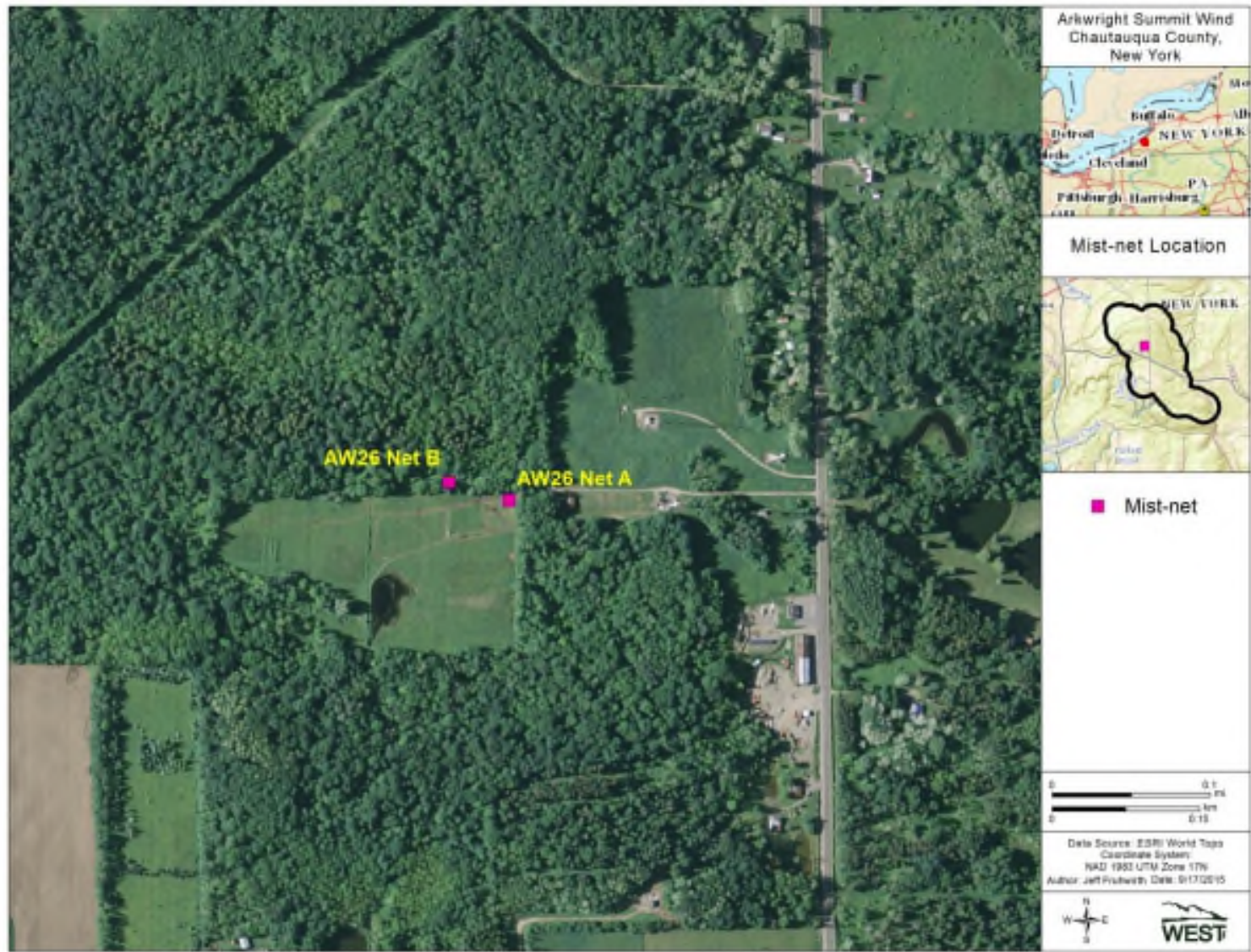
Appendix A. Maps of Northern Long-Eared Bat Surveys



Appendix A1. Land use and land cover at the Arkwright Summit Wind Farm.



Appendix A2. Northern long-eared bat acoustic and mist-net survey locations at the Arkwright Summit Wind Farm.



Appendix A3. Close up map of mist-net site AW-26 at the Arkwright Summit Wind Farm.

Appendix B. Photographs of Acoustic Survey Sites



Appendix B. Acoustic survey site AW-1.



Appendix B. Acoustic survey site AW-2.



Appendix B. Acoustic survey site AW-3.



Appendix B. Acoustic survey site AW-4.



Appendix B. Acoustic survey site AW-5.



Appendix B. Acoustic survey site AW-6.



Appendix B. Acoustic survey site AW-7.



Appendix B. Acoustic survey site AW-8.



Appendix B. Acoustic survey site AW-9.



Appendix B. Acoustic survey site AW-10.



Appendix B. Acoustic survey site AW-11.



Appendix B. Acoustic survey site AW-12.



Appendix B. Acoustic survey site AW-13.



Appendix B. Acoustic survey site AW-14.



Appendix B. Acoustic survey site AW-15.



Appendix B. Acoustic survey site AW-16.



Appendix B. Acoustic survey site AW-17.



Appendix B. Acoustic survey site AW-18.



Appendix B. Acoustic survey site AW-19.



Appendix B. Acoustic survey site AW-20.



Appendix B. Acoustic survey site AW-21.



Appendix B. Acoustic survey site AW-22.



Appendix B. Acoustic survey site AW-23.



Appendix B. Acoustic survey site AW-24.



Appendix B. Acoustic survey site AW-25.



Appendix B. Acoustic survey site AW-26.



Appendix B. Acoustic survey site AW-27.



Appendix B. Acoustic survey site AW-T1.



Appendix B. Acoustic survey site AW-T2.



Appendix B. Acoustic survey site AW-T3.



Appendix B. Acoustic survey site AW-T4.



Appendix B. Acoustic survey site AW-T5.



Appendix B. Acoustic survey site AW-T6.



Appendix B. Acoustic survey site AW-T7.



Appendix B. Acoustic survey site AW-T8.

Appendix C. Photographs of Mist-Net Survey Sites



Appendix C1. Bat habitat surveyed by mist-nets at AW-26 net A.



Appendix C2. Bat habitat surveyed by mist-nets at AW-26 net B.

Appendix D. Photographs of Captured Bats



Appendix D1. Big brown bat



Appendix D2. Eastern red bat

Appendix E. Summary of Mist-Net Captures

Appendix E. Details of bats captured at mist-net site AW-26; August 11 and 12, 2015.

Species	Sex	Age	Reproductive Status	Reichard Score	Weight (g)	Forearm Length (mm)
August 11						
Big brown bat	Male	Adult	Testes swollen	0	17.25	44.3
Eastern red bat	Male	Adult	Testes swollen	0	11.5	38.8
Eastern red bat	Male	Juvenile	Non-reproductive	0	12.0	37.8
August 12						
None						