

APPENDIX B

BATS

1.0 BAT DETECTION SURVEY EFFORT

During the March, April, May, June, August, September, and October 2009 shipboard surveys, a bat survey was conducted with Anabat II detectors as part of a research project conducted by a graduate student, Angela Sjollem, of the University of Maryland Center for Environmental Science. The goal of the research project was to conduct preliminary offshore wind turbine pre-construction surveys for bat activity along the Delmarva Peninsula. Research funding came from the Maryland Department of Natural Resources Power Plant Research Program. All bat data results are considered preliminary.

2.0 SURVEY AND ANALYSIS METHODS

Anabat II detectors were deployed to record the presence of offshore bats within the Study Area. Two detectors were used to prevent instances of no data collection in the event of equipment failure. One recording setup was attached to the port and one to the starboard sides of the *R/V Hugh R. Sharp* on the upward deck, approximately 6.1 to 7.6 meters (m; 20 to 25 feet [ft]) above sea level. Each setup consisted of an Anabat II bat detector, a ZCAIM (Zero Crossings Analysis Interface Modules; Titley Electronics, Ballina, New South Wales, Australia), and an external 12-Volt (V; 12 A h) battery. Anabat units are designed to detect ultrasonic frequencies up to 120 kilohertz (kHz); the information is recorded with a time and date stamp by the ZCAIM and recorded to a 256 megabyte (MB) compact flash (CF) card. The sensitivity was calibrated to the maximum detection distance of 30 m (98.4 ft). Monitors, ZCAIMs, and batteries were housed and kept in a waterproof fiberglass box (27.7×22.3×13.3 centimeter [cm; 10.9×8.8×5.2 inches (in.)). Polyvinyl chloride (PVC) pipe arched from the top of the box with a microphone (Titley Black Low Energy Mic) inside pointing towards a 20.32×20.32 cm (8×8 in.) Plexiglas sheet angled at 45 degrees (°). The fiberglass boxes were attached to conduit which was then fastened to the ship's railings with hoseclamps. The systems turned on and off automatically and were programmed to monitor from 1800 to 0800 in March and April, and from 1900 to 0700 in May, June, August, September, and October 2009.

After downloading the information from the CF card, extraneous sound files were deleted. Bat calls were identified by using visual comparisons from the region and a bat call identification key. Depending on the quality of the calls, a minimum of three individual call pulses were required. If less than three call pulses occurred the call was automatically categorized as no identification (NOID). Calls were analyzed to species whenever possible. Otherwise, they were categorized into groups (e.g., *Myotis* species [MYSPP] and *E. fuscus/Lasionycteris noctivagans* [EPFU/LANO]). A northeastern bat call library and a call identification key specific to northeastern bats were used to visually identify the bat calls (Amelon 2005). In order to find the coordinates of the bat calls, the time and date of each call were compared to global positioning system (GPS) data (Table B-1).

Table B-1. Bat species recorded within the Study Area by Anabat II detectors aboard ship offshore surveys in May, August, September, and October 2009.

Date	Time	Species	Latitude	Longitude
5/2/2009	23:24:52	EPFU/LANO	39.357912	-74.289357
8/1/2009	6:13:36	EPFU/LANO	38.8198	-75.046805
8/2/2009	22:06:48	NOID	39.902725	-74.03907
8/3/2009	0:05:20	LABO	39.908871	-74.02126
8/3/2009	22:24:15	LABO	39.699296	-74.0832866
8/3/2009	22:46:57	LABO	39.703073	-74.0786866
8/3/2009	23:07:08	LABO	39.70685	-74.07438
8/3/2009	23:45:59	LABO	39.712208	-74.067515
8/3/2009	23:46:14	LABO	39.712241	-74.06746
8/3/2009	0:14:52	NOID	39.9122316	-74.02126
8/3/2009	23:15:24	NOID	39.708038	-74.072888

Table B-1 (continued). Bat species recorded within the Study Area by Anabat II detectors aboard ship offshore surveys in May, August, September, and October 2009.

Date	Time	Species	Latitude	Longitude
8/4/2009	0:36:20	EPFU/LANO	39.71497	-74.0635683
8/4/2009	2:26:10	EPFU/LANO	39.665868	-74.08599
8/4/2009	0:17:24	LABO	39.7152083	-74.062656
8/4/2009	0:33:29	LABO	39.717453	-74.061705
8/4/2009	3:19:46	LABO	39.669888	-74.079396
8/4/2009	0:23:53	LACI	39.7156416	-74.0617
8/30/2009	21:09:27	LABO	39.29252	-74.31913
8/30/2009	21:19:03	LABO	39.291501	-74.31757
8/30/2009	22:22:51	LABO	39.273665	-74.284103
8/30/2009	21:21:18	NOID	39.29118	-74.317156
8/31/2009	5:06:24	EPFU/LANO	39.23229	-74.26682
8/31/2009	3:01:42	LABO	39.207816	-74.381316
8/31/2009	3:05:18	LABO	39.209398	-74.378081
8/31/2009	3:29:49	LABO	39.22086	-74.358861
8/31/2009	23:27:06	LABO	39.47686	-74.10793
8/31/2009	23:51:25	LABO	39.450551	-74.128063
8/31/2009	3:33:52	MYSP	39.22292	-74.35515
8/31/2009	0:15:31	NOID	39.190826	-74.428455
8/31/2009	3:05:33	NOID	39.209473	-74.37791
8/31/2009	3:05:42	NOID	39.20973	-74.37791
8/31/2009	3:06:03	NOID	39.20977	-74.377341
8/31/2009	3:06:16	NOID	39.20977	-74.377341
8/31/2009	3:06:29	NOID	39.20977	-74.377341
8/31/2009	3:08:06	NOID	39.210576	-74.37574
8/31/2009	3:08:21	NOID	39.210576	-74.37574
8/31/2009	3:29:21	NOID	39.22086	-74.358861
8/31/2009	3:44:48	NOID	39.22837	-74.34373
8/31/2009	4:55:47	NOID	39.2474	-74.27777
9/30/2009	23:17:53	EPFU/LANO	39.627555	-74.016275
9/30/2009	23:59:37	MYSP	39.746381	-73.965431
9/30/2009	22:15:46	NOID	39.627555	-74.016275
9/30/2009	22:19:41	NOID	39.627555	-74.016275
9/30/2009	22:19:58	NOID	39.627555	-74.016275
9/30/2009	22:20:10	NOID	39.627555	-74.016275
9/30/2009	23:43:06	NOID	39.76822	-73.953931
9/30/2009	23:59:45	NOID	39.746381	-73.965431
10/1/2009	0:40:20	LABO	39.68844	-73.989225
10/1/2009	0:04:26	LABO	39.73964	-73.968515
10/1/2009	0:06:57	MYSP	39.73608	-73.96978
10/1/2009	0:33:32	NOID	39.69824	-73.98535
10/1/2009	1:34:12	NOID	39.61145	-74.02057
10/1/2009	6:29:21	NOID	39.88717	-73.89198
10/1/2009	21:57:26	NOID	39.45579	-74.121545

EPFU/LANO = *Eptesicus fuscus/Lasionycteris noctivagans*, LABO = *Lasiurus borealis*, LACI = *Lasiurus cinereus*, MYSP = *Myotis* sp., NOID = No identification (unknown)

3.0 RESULTS

Bats were not recorded on the surveys in March, April, and June 2009. On 2 May 2009 one big brown/silver-haired bat (*Eptesicus fuscus*/*Lasionycteris noctivagans*) was recorded offshore (Tables B-1 and B-2). Bats were recorded on eight different nights in August, September, and October 2009 (Table B-1). A total of 54 calls were archived: 25 unidentifiable, 19 Eastern red bats, six big brown/silver-haired bats, three *Myotis* species (*Myotis* sp.), and one hoary bat (Table B-2). The farthest a bat was recorded from shore was 19.2 km (10.4 NM) and the mean distance was 10.6 km (5.2 NM; Figure B-1).

Table B-2. Bat species recorded in the Study Area by Anabat II detectors during shipboard offshore surveys in May, August, September, and October 2009.

Bat species		Date				Total
Common name	Scientific name	2 to 6 May	1-5 Aug	30 Aug to 3 Sep	28 Sep to 2 Oct	
Big brown/silver haired bat	<i>Eptesicus fuscus</i> / <i>Lasionycteris noctivagans</i>	1	3	1	1	6
Eastern red bat	<i>Lasiurus borealis</i>		9	8	2	19
Hoary bat	<i>Lasiurus cinereus</i>		1			1
<i>Myotis</i> sp.	<i>Myotis</i> sp.			1	2	3
Unknown			3	12	10	25
Total		1	16	22	15	

4.0 LITERATURE CITED

Amelon, S. 2005. Preliminary key to the qualitative identification of calls with the Anabat system. Bat Conservation International acoustic monitoring workshop. Barree, Pennsylvania, 8-13 August 2005.

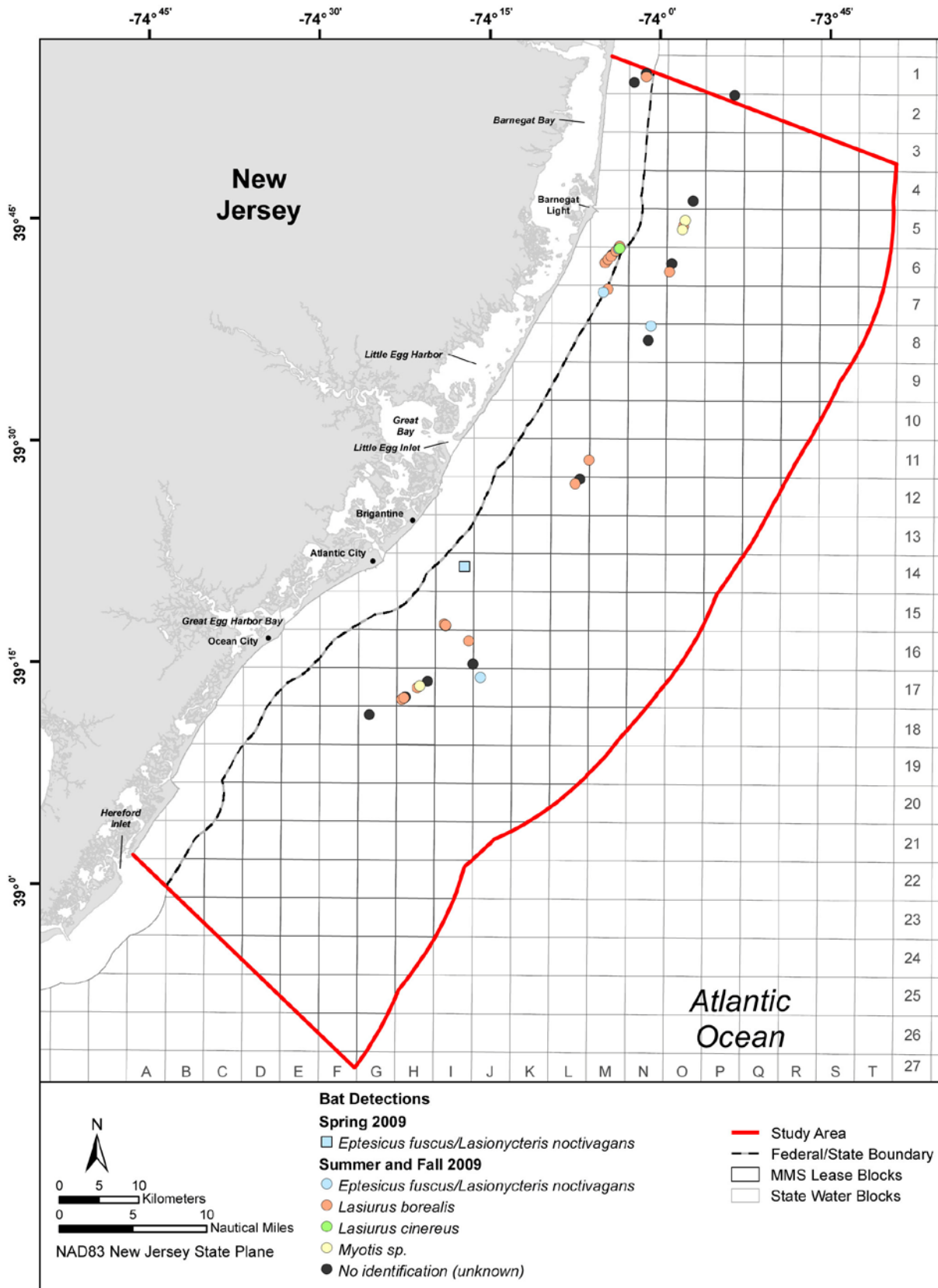


Figure B-1. Bat echolocations in the Study Area. Bats were located by Anabat II detectors during ship offshore surveys in May and August through October 2009.