

**Northern Long-eared Bat Acoustic Presence/Absence Survey
Heritage Mine
Jasper County, SC
September 27, 2025**

**Prepared for:
Davis and Floyd**

Study Site

The project site is approximately 91 acres in Jasper County, South Carolina. The site is characterized as a second generation industrial pine plantation. When these stands were established, they were disked and bedded with a Savannah Plow and planted with 500 to 700 loblolly pines per acre. Currently, the forested stands range in age from 5 to 10 years. Because of their industrial purpose, these stands lack diversity, provide minimal wildlife value, and are often referred to as biological deserts. The spacing and crown coverage within these stands greatly decreases the light at the forest floor and generally shades out competing species.

Methods

The survey and analytical approach and protocols followed the “Range-wide Indiana Bat & Northern Long-eared Bat Survey Guidelines” (USFWS 2024). To obtain species presence, ultrasonic acoustic detectors were used to determine which species are occupying and utilizing the project area.

Phase 1 – Habitat Survey

The total amount of suitable summer habitat was estimated using current, available aerial photography and site visits. It was determined the site had approximately 91 acres of potential habitat.

Phase 2 - Acoustic Sampling

Acoustic surveys were conducted in suitable bat habitat identified within the project area. Surveys targeted areas where bat activity is likely highest. These included flight corridors created by perennial road ruts and old road right of ways, creeks, ponds, or other waterways, as well as potential foraging areas (e.g., forest clearings). Acoustic survey location HM481 was located in a tree gap. Acoustic survey location HM101 was located on a forest management road/trail. Acoustic survey location HM935 was located on the edge of a wildlife food plot. While survey locations are maintained as close as possible to the study plan proposed locations, it is sometimes necessary to make minor adjustments onsite to ensure the detectors are placed in the best habitat location and that the detectors have an unobstructed view from the surrounding vegetation.

A Songmeter mini-bat using the internal SM-UU1 omni-directional microphone (weatherproof design Wildlife Acoustics, Maynard, Massachusetts) was deployed at each survey location (Table 1). To ensure the equipment was working, fingers were rubbed in front of the microphone. The survey effort followed the appropriate guidelines for non-linear projects: a minimum of 2 locations and 14 detector nights per 123 acres of suitable summer habitat (USFWS 2024). The detectors were deployed from September 4 – 21, 2025. A total of 36 usable nights were collected (Table 2). Given the possibility of detector failure a

third detector was deployed on site. Sustained wind speeds greater than 9 miles/hour for 30 minutes or more during the first 5 hours of the survey period was the primary reason for non-usable days.

Table 1. Detector Deployment

LAT (decimal degree)	LONG (decimal degree)	Site	Start Time	End Time	Microphone Height (m)	Horizontal Orientation of Directional Microphone (1-360 degree)	Vertical Orientation of Directional Microphone (approx. degrees)	Name of Person who Selected Acoustic Site	Name of Person who Deployed Detector
32.69111	-81.0538	HM481	30 minutes before sunset	30 minutes after sunrise	3	128	45 (angled upward)	WMB	GSL
32.68986	-81.0540	HM101	30 minutes before sunset	30 minutes after sunrise	3	354	45 (angled upward)	WMB	GSL
32.69525	-81.0506	HM935	30 minutes before sunset	30 minutes after sunrise	3	190	45 (angled upward)	WMB	GSL

Twelve species were screened for, based on the geographic location of the project. Data was collected in full spectrum format. USFWS approved software Kaleidoscope Pro Bats v5.7 with the North America Classifier v5.7 using the balanced setting (0) and a 95% confidence threshold for the maximum likelihood estimator (MLE) ($\alpha < 0.05$) was utilized for the analysis. The probability values provided in the guidelines (95%) from the MLE is a measure of the probability that the call parameters recorded match the distribution of the known or established call parameters of a species.

Results

A total of 7,287 call files were collected of which 3,056 were bat calls, 1,438 could not be identified, and 2,793 were classified as noise (Table 3). From these calls, 11 species were determined to be present within the project area: Big Brown bat, Eastern red bat, Hoary bat, Northern Yellow Bat, Silver-haired bat, Seminole bat, Southern myotis, Little brown bat, Evening bat, Tricolored bat, and Mexican free-tailed bat. The site also had a high number of insect calls which were classified as noise.

Discussion

No call files were associated with Northern Long-eared Bat (NLEB). The tricolored bat was detected onsite with a MLE < 0.05 . The tricolored bat has been experiencing dramatic population declines throughout much of its range due to the lethal effects of white-nose syndrome. This species is currently proposed for listing by USFWS (USFWS 2022). Qualitative analysis was also performed on no ID call files at or greater than 38kHz. While Newkirk Forestry and Land Management LLC is confident in our survey results, only the USFWS can approve the results.

Respectfully submitted:

W Mac Baughman

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Table 2. Weather Data

Date	Usable	Reason
9/4/2025	yes	
9/5/2025	yes	
9/6/2025	yes	
9/7/2025	no	wind
9/8/2025	no	wind
9/9/2025	no	wind
9/10/2025	yes	
9/11/2025	yes	
9/12/2025	no	wind
9/13/2025	no	wind
9/14/2025	yes	
9/15/2025	yes	
9/16/2025	yes	
9/17/2025	yes	
9/18/2025	yes	
9/19/2025	yes	
9/20/2025	yes	

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Table 3. Id Summary Weather Adjusted Combined Table

maximum likelihood estimator (MLE) ($\alpha < 0.05$)

KALEIDOSCOPE 5.7.0																
Bats of U.S. and Canada 5.7.0 S/A: 0																
		EPTFUS	LASBOR	LASCIN	LASINT	LASVOC	LASSEM	MYOALUS	MYOLUC	MYOSEP	NYCHJUM	PERSUB	TADBRA	NOID	NOISE	
		1043	215	72	381	280	194	20	11	0	400	269	171	1438	2793	
+	+															
HH481	+	4	5	5	26	51	36	6	1	0	11	20	36	130	781	
	20250904	1			3	6	6				1		5	14	119	
	20250905		3	1	2	8	1				2	2	12	20	96	
	20250906				5	5	5				1	2	2	22	25	
	20250910				2	2	3	1			2	2	2	10	49	
	20250911				3	8	3				1	2	7	8	134	
	20250914	1	1	2	3	5	2				1	4		11	30	
	20250915	1			4	3	1					1		4	56	
	20250916		1	1	2	3	1		1				4	6	58	
	20250917			1	2	6	5	1			2	3	1	12	99	
	20250918	1				1	4	3				1	3	14	80	
	20250919					4	5	1			1	3		9	73	
	20250920													0	2	
HM101	+	46	10	9	44	33	39	7	1	0	42	76	46	161	119	
	20250904	7	1	3	4	4	8				2	4	2	9	9	
	20250905	3	1		16	9	1	1			3	7	14	16	9	
	20250906	20			4	2	1				7	7	6	16	7	
	20250910	3	1		1		7				7	7	6	15	7	
	20250911	4	1	1	1	2	4		1		6	19	5	23	13	
	20250914	1				1	3				2	7	1	16	3	
	20250915	3	1		5	3	1	4			2	1	12	11		
	20250916	1	1	2	1	2	1				2	5	5	7	8	
	20250917	3	2	1	4	4	3				1	8	3	17	9	
	20250918	1	1	1	1	3	3				4	7	3	14	27	
	20250919	3		2	6	4	6	1			8	3		13	14	
	20250920													3	2	
HM335	+	993	200	58	311	196	119	7	9	0	347	173	89	1147	1893	
	20250904	67	4	5	8	30	6	1			10	10	18	56	47	
	20250905	43	2	1	3	63	13				3	9	15	53	56	
	20250906	28	15	7	2	33	6		1		26	9	18	49	88	
	20250910	164	6	18	3	8	5		3		2	10	6	86	43	
	20250911	89	8	3	220	22	4		1		38	7	8	137	66	
	20250914	153	3	6	48		5		2		7	9	1	87	958	
	20250915	190	4	9	12	4	7				15	7	1	171	227	
	20250916	201	8	4	4	6	8				10	14	8	108	75	
	20250917	16	67	1	2	11	17	1	2		44	39	6	120	193	
	20250918	28	47	2	3	3	29	4			73	23	4	154	68	
	20250919	1	36	1	3	4	15	1			112	36	3	94	54	
	20250920	3		1	3	12	4				7		1	32	18	
Presence																
		EPTFUS	LASBOR	LASCIN	LASINT	LASVOC	LASSEM	MYOALUS	MYOLUC	MYOSEP	NYCHJUM	PERSUB	TADBRA			
		0	0	0	0	0.6718434	0	0	0	1	1	0	0	0	0	0
		1	0.0057779	0.021275	0.0000004	0	0	0	0.338084	1	1	1	0	0	0	0
		1	1	1	1	0.4361057	0.0167635	0.0006691	1	1	1	1	1	1	0.0029411	
		1	0.0021856	0.951403	1	0.030599	0.9033763	1	1	1	0.8558256	0.134151	0	0	0	0
		1	1	1	1	0.013388	0.0216593	0.0022944	1	1	1	1	1	0.230368	0.3648079	
		1	1	1	1	0.3144576	0.3734783	0.0667387	1	1	1	1	1	0.182064	0.1037039	
		1	1	1	1	0.6879309	0.0036527	0.0341129	1	1	1	1	1	0.13138	0.0001443	
		0.998825	0.2939918	0.029728	0.0914222	0.0267485	0.1814827	1	1	1	1	1	1	0.001935	1	
		0.983279	1	1	0.0081395	0.1084421	0.2659588	1	1	1	1	1	1	0.230917	1	
		1	0.2461604	0.548949	0.6141494	0.3623723	0.5467087	1	0.145814	1	1	1	1	0.005328		
		1	1	0.356575	0.4782315	0.0023114	0.0043969	0.0234741	1	1	1	1	0.067622	0.8752333		
		0.733885	1	1	1	0.9053543	0.0044011	0.0000129	1	1	1	1	0.620841	0.0052424		
		1	1	1	1	0.0018024	0.002208	0.0234725	1	1	1	1	0.050462	1		
		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0	0.0001204	0.009452	0	0.0123777	0	0	0.78519	1	0.0032586	0	0	0	0	0
		0.003663	0.6744788	0.02818	0.1823448	0.6026004	0.0001151	1	1	1	1	0.038155	0.7163424			
		1	0.3935045	1	0.000005	0.1243217	0.908471	0.0234767	1	1	1	0.508583	2.3E-06	0	0	0
		0	1	1	0.8613316	1	1	1	1	1	0.0372531	8.4E-06	0.0001724			
		0.171361	0.799641	1	1	1	0.0089365	1	1	1	0.8878773	0.000828	0.0000194			
		0.049216	0.7407807	0.717828	1	0.9497486	0.162318	1	0.743928	1	0.636374	0	0.0017241			
		1	0.430093	1	1	0.489417	0.0623644	1	1	1	1	1	1.12E-05	0.2434799		
		0.329929	0.1457311	1	0.0084882	0.3380977	0.9410709	0.0000003	1	1	1	0.051171	0.8708212			
		1	0.359809	0.581708	0.599424	1	0.2949197	0.0234767	1	1	0.9860961	0.000447	0.0005518			
		0.384586	0.0533211	0.572609	0.115245	0.2538587	0.0775926	1	1	1	1	1	8E-07	0.1270604		
		1	0.5448872	0.471038	0.9481024	0.2344543	0.2208914	1	1	1	0.8059247	3.18E-05	0.0384439			
		0.466401	1	0.0432	0.0019671	0.269476	0.0408915	0.0234767	1	1	0.5711613	0.214003	1			
		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		0	0	0	3E-07	0	1	0.0000069	0	1	1	1	0	0	0	1
		0	0.016133	0.630409	1	0.0028915	0.1252629	0.0217261	1	1	0.3734574	8.8E-06	0.000368			
		0	0.35162	1	1	0	0.0000004	1	1	1	1	1	8.53E-05	0.0175837		
		0	0	0.023816	1	0.0000001	0.9989547	1	1	1	0.0001865	0.003113	0.0000167			
		0	0.0000592	0.000202	1	1	0.0439802	1	0.045311	1	1	1	4E-07	1		
		0	0.0017675	0.870415	0	1	1	1	1	1	1	0.048132	1			
		0	0.0614178	1	0.00000021	1	0.1351543	1	0.162201	1	0.6246271	0.00001	1			
		0	0.0409078	0.743462	1	1	0.1782579	1	1	1	0.0748471	0.004748	1			
		0	0.0000071	1	1	1	0.0333004	1	1	1	0.7512962	0	1			
		0	0	0.990339	1	0.0161252	0.6523015	0.012054	1	1	0.004383	0	0.0359234			
		0	0	0.740341	1	1	0.0341189	0.0000003	1	1	0.0000013	3.23E-05	0.4285516			
		1	0	0.493487	0.2178201	0.1282237	1	0.019406	1	1	0	0	0.080433			
		0.620515	1	0.59711	0.517033	0.0000017	0.2297548	1	1	1	0.3474293	1	1			



Location Map

Date: 9/27/2025

Created by: Mac Baughman

Heritage Mine

Appendix A:

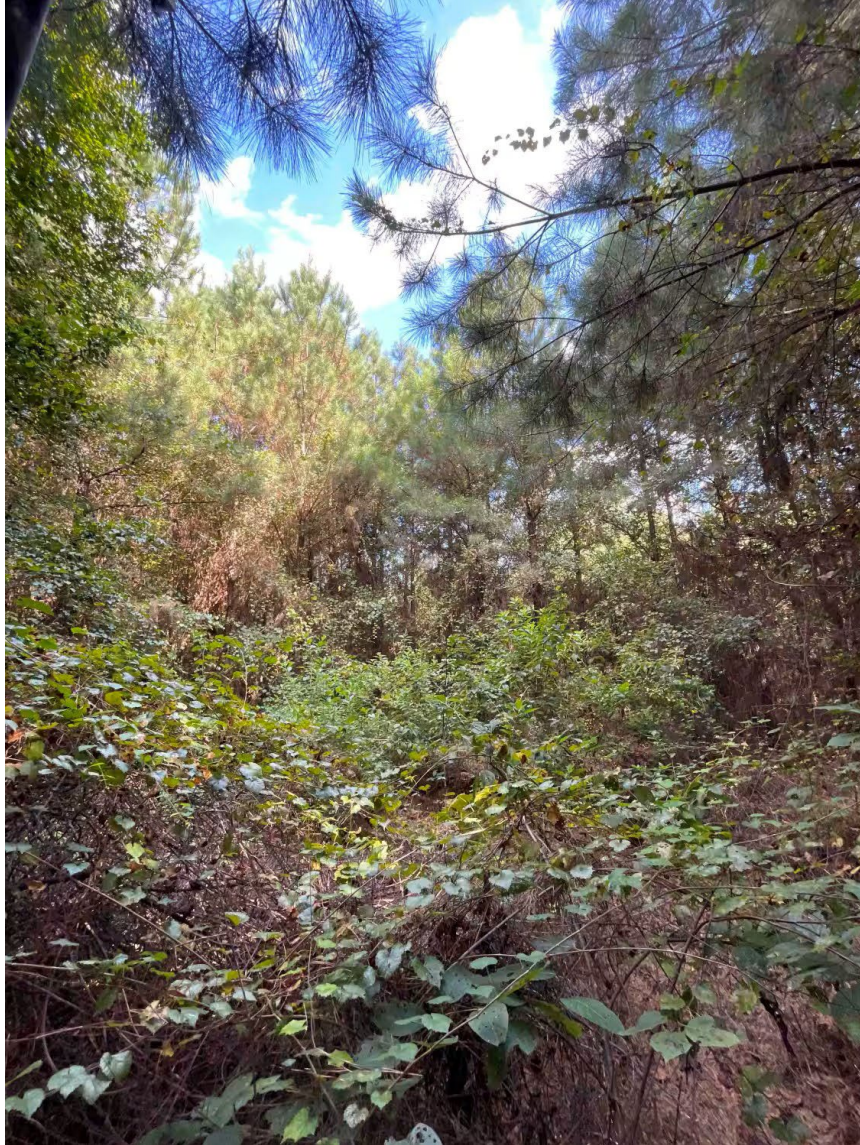
Bat acoustic survey location photographs on the Heritage Mine, Jasper County, SC
September 4 - 21, 2025.



Detector HM481 – tree gap



Detector HM481 – tree gap



Detector HM481 – tree gap



Detector HM101 – Forest management road/trail



Detector HM101 – Forest management road/trail



Detector HM101 – Forest management road/trail



Detector HM934 – wildlife food plot



Detector HM934 – wildlife food plot

Standardized pole system

All poles placed in the ground with a soil auger (0.9 meters).

Detector height after placement 3 meters

Base of pole system constructed out of 2-inch PVC



Appendix B: Ultrasonic Default Settings

sample rate: 256 kHz

minimum trigger frequency: 16 kHz

maximum recording length: 15 sec

trigger window: 3 sec

save noise files: off

left channel gain: 12 dB