

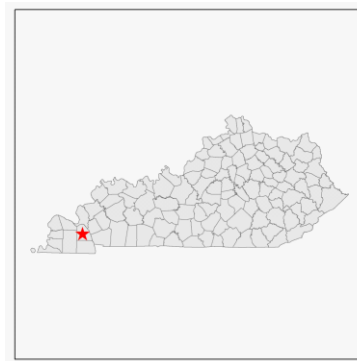


Region 4 Inventory and Monitoring Branch

Mobile Acoustical Bat Monitoring Annual Summary Report

2016

CLARKS RIVER NATIONAL WILDLIFE REFUGE



The Region 4 Inventory and Monitoring Branch coordinated acoustical bat monitoring on 58 National Wildlife Refuges and 2 Ecological Services field offices in Regions 2, 3, and 4 during the 2016 field season. Surveys establish baseline inventories of bat species at each station and contribute to a landscape-level understanding of bat population trends and habitat associations. Bat call data were collected using Anabat SD2 detectors along road-based transects during June and July each year following the procedures outlined in the Mobile Bat Acoustical Survey Protocol (USFWS 2012*).

This report summarizes bat calls collected along transects at your station in 2016 and provides annual species detections from 2012 to 2015 for comparison. Calls were classified in 2016 using the BCID Eastern USA (version 2.7c) software and restricted to calls with 5 or more pulses. This annual summary report package contains summary information on transect surveys, and a digital folder containing shapefiles and BCID classification output files. Summary tables include all classified species observations including those that did not have an associated spatial reference.

All submitted raw call data and survey metadata have been archived and are available on the Mobile Acoustical Bat Monitoring SharePoint site (<https://fishnet.fws.doi.net/regions/4/nwrs/IM/bats>). Bat call files, GPS data, and survey metadata sheets were reviewed for quality assurance prior to generation of this report. Some submitted data were necessarily excluded due to identified errors in collection processes.

**U.S Fish and Wildlife Service. 2012. Mobile Bat Acoustical Survey Protocol, U.S. Fish and Wildlife Service, Region 4, Division of Refuges*

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Route Name: ClkNWR

Survey date	# bat calls	Route completed?	GPS data?	Survey notes
6/7/2016	68	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

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Route: ClkNWR

Length of transect (miles): 32.82

2016 Nightly Summary

	<u>Survey date</u>	<u>Total observed</u>	<u>Bats/mile</u>
Eastern Red Bat			
	6/7/2016	20	0.61
Eastern Small-footed Bat			
	6/7/2016	1	0.03
Evening Bat			
	6/7/2016	26	0.79
Indiana Bat			
	6/7/2016	1	0.03
Little Brown Bat			
	6/7/2016	7	0.21
Southeastern Myotis			
	6/7/2016	4	0.12
Tricolored Bat			
	6/7/2016	7	0.21
Unknown			
	6/7/2016	2	0.06

Species Summary 2012-2016

Below are the results of the auto-classification of search-phase echolocations of bats detected along survey routes from 2012-2016 generated from the BCID Eastern USA software program (Version 2.7c). Automated acoustical bat classification has inherent limitations based in part on call quality, species filter constraints, and statistical model agreement parameters. Species filters were used to limited the output to only those bat species expected to occur at a field station during the sampling interval. Using a conservative approach to generate robust species classifications, calls with fewer than 5 pulses were not classified; therefore the estimates presented here may under-represent the actual number of bats detected on a survey night. Classified calls were geo-referenced using the package MABM in Program R to combine GPS locations with individual calls based on unique Date and Time parameters. If GPS time intervals did match a the time stamp of a call file, the location was approximated based on the nearest corresponding GPS location along the route. Accuracy of call classification varies among species but is reported to be >85% correct. Measures of confidence in species identification for each survey night are available as a maximum-likelihood estimator p-value for each observed species in the BCID output files included with this summary report package. BCID software does not classify the following species (Seminole bat - LASE, Northern yellow bat - LAIN, Brazilian free-tailed bat - TABR). If these species occur within your monitoring area, the calls generally will be classified to a species with the closest model agreement or classified to "unknown". Species summary tables include all classified calls including those without a spatial reference.

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ClkNWR

Length of transect (miles): 32.82

	<u>Total observed</u>	<u># Survey nights</u>	<u># Bats/night</u>	<u># Bats/mile</u>
Big Brown Bat				
2012	1	2	0.5	0.02
2013	3	2	1.5	0.05
2015	1	2	0.5	0.02
Eastern Red Bat				
2012	39	2	19.5	0.59
2013	20	2	10	0.3
2014	18	2	9	0.27
2015	22	2	11	0.34
2016	20	1	20	0.61
Eastern Small-footed Bat				
2016	1	1	1	0.03
Evening Bat				
2012	47	2	23.5	0.72
2013	51	2	25.5	0.78

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	2014	25	2	12.5	0.38
	2015	32	2	16	0.49
	2016	26	1	26	0.79
Hoary Bat					
	2012	1	2	0.5	0.02
	2015	1	2	0.5	0.02
Indiana Bat					
	2012	1	2	0.5	0.02
	2014	1	2	0.5	0.02
	2015	1	2	0.5	0.02
	2016	1	1	1	0.03
Little Brown Bat					
	2012	8	2	4	0.12
	2013	2	2	1	0.03
	2014	2	2	1	0.03
	2015	2	2	1	0.03
	2016	7	1	7	0.21
Northern Long-eared Bat					
	2012	1	2	0.5	0.02
	2015	1	2	0.5	0.02
Rafinesque's Big-eared Bat					
	2015	1	2	0.5	0.02
Southeastern Myotis					
	2012	1	2	0.5	0.02
	2016	4	1	4	0.12
Tricolored Bat					
	2012	30	2	15	0.46
	2013	8	2	4	0.12
	2014	16	2	8	0.24
	2015	16	2	8	0.24

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Unknown	2016	7	1	7	0.21
	2012	8	2	4	0.12
	2013	4	2	2	0.06
	2014	2	2	1	0.03
	2015	1	2	0.5	0.02
	2016	2	1	2	0.06