

# Cave and mine use by tree-roosting bats

Caitlin J. Campbell and Hannah B. Vander Zanden  
Department of Biology, University of Florida, Gainesville FL USA

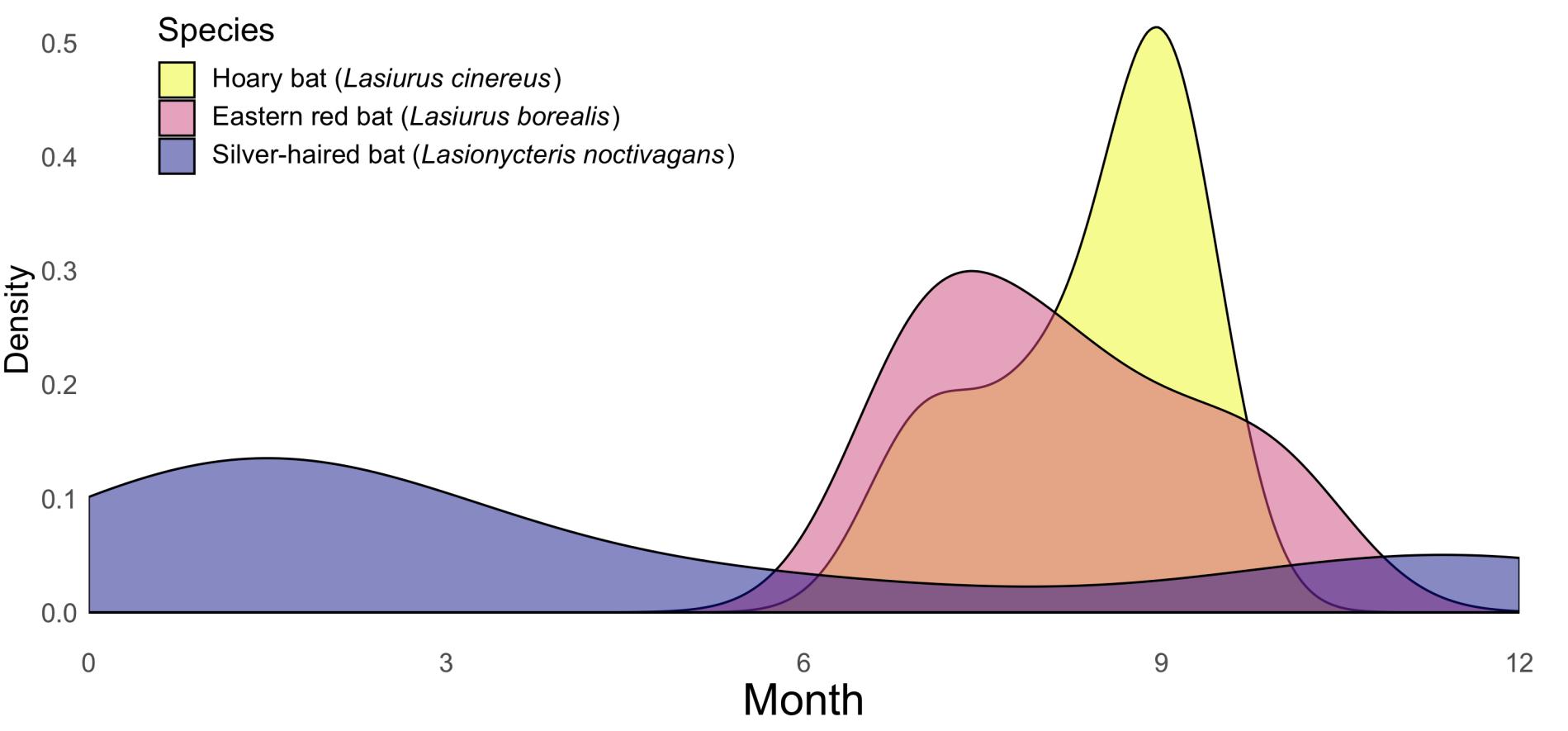
## Tree bats aren't always in trees

- The roosting and general habitat preferences of migratory North American "tree-roosting" bats are poorly-understood.
- We conducted a review of records of these bats found within caves and mines, habitats they aren't commonly thought to use.
- Tree-roosting bats are infrequently but regularly observed using cave and mine habitats:
  - Lasiusurus* primarily in the fall (during mating and migration season)
  - Lasionycteris* primarily while overwintering.

## What does it mean?

- Lasiusurus* may enter caves and mines during fall swarm / migration
  - Accidental entry or deliberate (though rare) habitat use?
- Lasionycteris* uses caves and mines to overwinter
  - Important, understudied habitat use
- Implications for these species as potential vectors of White-nose syndrome (WNS)

## Densities of observations of living individuals found in caves or mines over the course of a year



## Where did we find records?

- In the literature
  - By search term and citation. All records cite primary sources.
- Museum databases
  - Parsed matches with "cave", "mine", "grotto", "quarry", or "grotte" (French)
- Community-science platform
  - We parsed through all photos of each species on iNaturalist.org

Send us  
your  
records!

caitlincampbell@ufl.edu  
@BatsOnTheMove  
cjcampbell

## Records of cave and mine use

Species	Observation type	USGS Karst areas
Hoary bat ( <i>Lasiusurus cinereus</i> )	Alive	
Eastern red bat ( <i>Lasiusurus borealis</i> )	Dead	
Silver-haired bat ( <i>Lasionycteris noctivagans</i> )		

These species are of growing conservation concern, as they comprise  $\geq 75\%$  of bats killed at wind-energy facilities. Thus, understanding habitat use and preferences is a research priority.  
Arnett and Baerwald, 2013; Frick et al., 2017; Kunz et al., 2007

An iNaturalist observation of an eastern red bat in a cave used for commercial tours prompted interest in this project. The bat was observed seemingly alive in August 2019.  
<https://www.inaturalist.org/observations/30965398>



The earliest records in this dataset is a reference to specimens taken prior to the 1900's:

[Eastern red bat] specimens have been obtained from a cave near Albany, N.Y., by G. J. Green, and the collection of the Museum of Comparative Zoology contains a specimen... which was secured in Short Cave, Kentucky.  
Allen 1893

We found a diversity of records of torpid silver-haired bats overwintering in the Appalachians and mid-Atlantic regions, e.g.: A West Virginia Cave Record for the Silver-Haired Bat

On April 12, 1952, a silver-haired bat, *Lasionycteris noctivagans*, was found in Greenville Saltwater Cave, Greenville, Monroe County, West Virginia, by Christy A. Weiland, Jr., while he was collecting bats for banding. The animal was an adult male and was hanging by itself approximately 1000 feet from the cave entrance and was brought to me by Weiland. The specimen was sent alive to W. Gene Frum and is now No. 1848 in his collection. Nearby were found *Pipistrellus s. subflavus* and *Myotis sodalis*, which were seen in the cave. The Silver-haired bat is one of the so-called tree bats and it is unusual to find it in a cave.

WAYNE H. DAVIS, 307 Duquesne Ave., Morgantown, W. Va.  
Davis 1952

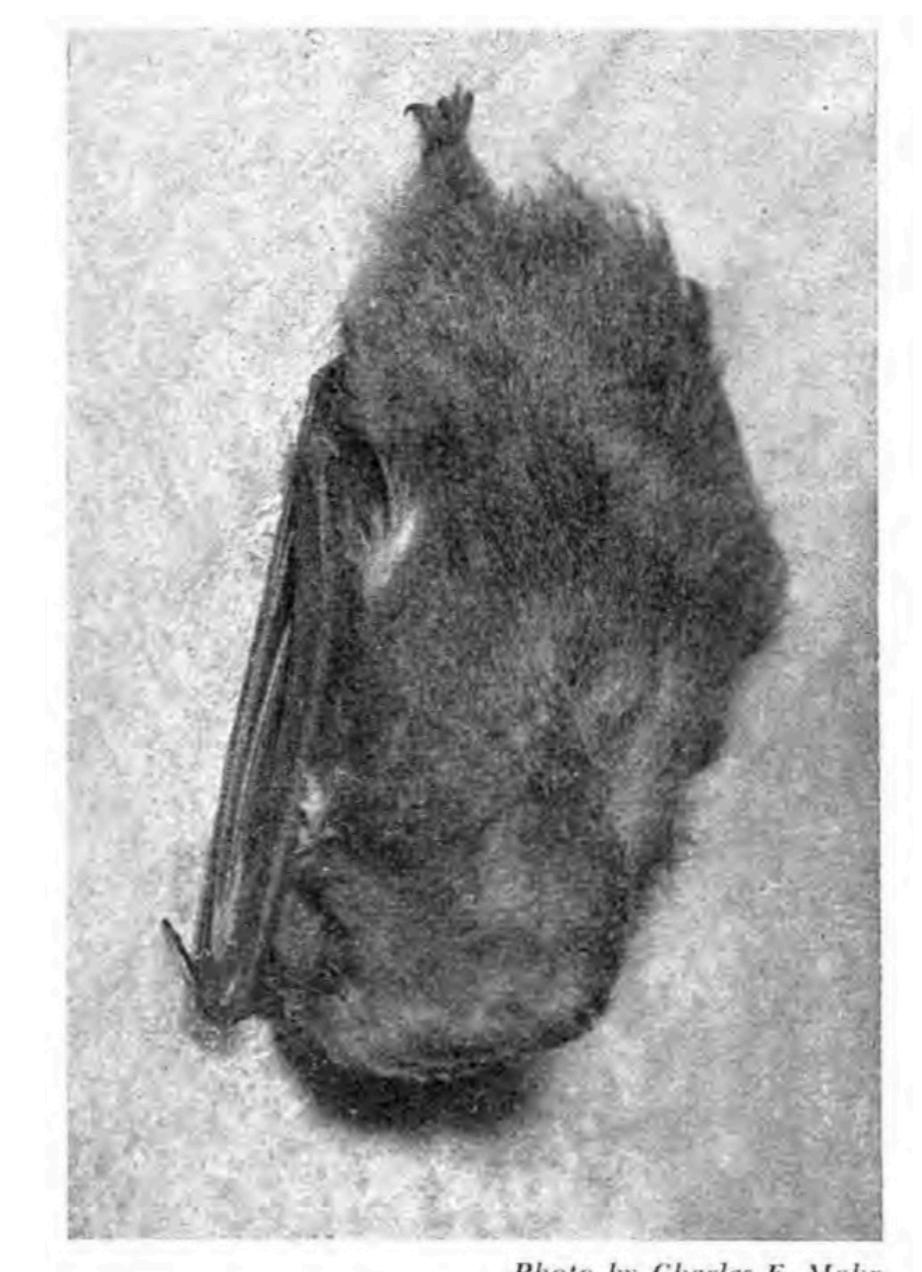


Photo by Charles E. Mohr  
RED BAT hanging dead, as it appeared when found in Nick-Nack Cave. Few red in color, it's brighter, larger, and more farty than the pipistrelle and has quite inconspicuous ears. It belongs to the so-called tree bats.

Mohr, C. E. 1952

All records of living hoary bats in caves and mines came from one source, a survey of lasiurines in Missouri caves:

TABLE 1.—Total number of lasiurine bats from Missouri caves, 1954–1958

DATE	CAVE	COUNTY	NUMBER OF BATS COLLECTED		ZONE IN CAVE
			<i>L. borealis</i>	<i>L. cinereus</i>	
July 1954	Tunnel	Pulaski	3 ♂, alive		by entrance
July 1954	Bar	Pulaski	46 alive/fresh dead	2 ♂, alive	far inside
to present			60 skulls/skel.	5 skulls/skel.	
Sept. 1954	Spring	Pulaski	3 skulls		
Oct. 1954	Bruce	Pulaski	3 skulls		
Oct. 1954	Piquet	Pulaski	77 alive/fresh dead	1 ♂, dead	far inside
to present			190 skulls/skel.	8 skulls/skel.	
Feb. 1955	Freeman	Pulaski	1 mummified		by entrance
Aug. 1955	Ine	Pulaski	142 alive/fresh dead	3 ♂, 1 ♀	far inside
to present			1,100 skulls/skel.	alive, 2 skulls	
April 1957	Joel	Camden	1 skull		far inside
Oct. 1957	Carrell	Camden	1 skull		far inside
Oct. 1957	Hunter's	Boone	1 mummified		by entrance
Nov. 1957	Unnamed	Boone	1 skull		far inside
April 1958	Powder	Shannon	5 skulls	1 skull	far inside
Aug. 1958	Mill	Laclede			
	Bat	Laclede	1 skeleton		far inside

Myers, R. F. 1960.

We found several records from northern Arkansas: Two living eastern reds in Stone and Independence Co.'s, and the remains of all three species found in caves including Blanchard Springs Cavern and Rowland Cave.

Grove 1974; Saugey et al. 1978, 1998; Lanier et al. 2019 (museum record)