Proceedings of the Indiana Academy of Science
(1991) Volume 99, p. 199-201

DURATION OF BAT COLONIES IN INDIANA

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ABSTRACT: Cope et al. (1) located 190 maternity colonies of bats in buildings during the summer of 1959. A total of 128 was revisited in 1989, including 1 of the Eastern Pipistrelle, *Pipistrellus subflavus*, 5 of the Evening Bat, *Nycticeius humeralis*, 27 of the Little Brown Bat, *Myotis lucifugus*, and 95 of the Big Brown Bat, *Eptesicus fuscus*. Of the remainder, some could not be located and permission could not be obtained to enter others. The purpose of the present study was to determine the number of colonies still active in order to assess duration and to determine reasons for colony disappearance. The pipistrelle and Evening Bat colonies were no longer active, whereas 8 of the Little Brown Bat colonies (29.6%) and 21 of the Big Brown Bat colonies (22.1%) were still active. Many of the colonies were inactive because the buildings were gone, or the bats structurally excluded. However, 40 of 69 (58.0%) buildings still standing and apparently inhabitable, no longer harbored bats. Overall about 3.3% of the colonies had disappeared each year.

INTRODUCTION

Some bat colonies exist for many years, presumably recruiting new members both from within the colony and from elsewhere. However, other colonies are evicted by the owners of buildings; buildings are destroyed; or bats may desert the original colonies themselves. For bat conservation purposes it would be well to be know how long bat colonies exist, and what causes them to become inactive.

Thirty years ago (1959) James B. Cope and associates used "Bats Wanted" posters displayed at strategic locations around Indiana to locate colonies of bats (1). They located 190 active nursery colonies of four species of bats by this method, 1 of the Eastern Pipistrelle, *Pipistrellus subflavus*, 6 of the Evening Bat, *Nycticeius humeralis*, 41 of the Little Brown Bat, *Myotis lucifugus*, and 142 of the Big Brown Bat, *Eptesicus fuscus*.

The present study was initiated in order to determine how many of the colonies located 30 years ago were still active and to ascertain, when possible, when they became inactive, and why.

MATERIALS AND METHODS

As many of the original 190 bat colonies as possible were revisited in the summer of 1989. Some could not be located because the original data sheets were lacking or

Table 1. Status in 1989 of Big and Little Brown Bat colonies which had been active in 1959.

	Barns	Houses	Churches	Other Buildings	TOTAL
Eptesicus fuscus					
1959	71	9	7	8	95
1989	16	2	1	2	21
% remaining	22.5	22.2	14.3	25.0	22.1
Reasons for loss of colony					
Bldg burned	11	0	0	0	11
Bldg otherwise gone	14	2	1	3	20
Bats built out	1	2	0	1	4
Exterminated	1	0	4	1	6
No apparent reason	28	3	1	1	33
	55	7	6	6	74
Myotis lucifugus					
1959	8*	11	4	4	27
1989	2	3	2	1	8
% remaining	25.0	27.3	50.0	25.0	29.6
Reasons for loss of colony					
Bldg otherwise of colony	2	3		2	7
Bats built out		3	1		4
Exterminated		1			1
No apparent reason	4	1	1	1	7
	6	8	2	3	19

* Two barns that harbored *Myotis lucifugus* in 1959 harbored *Eptesicus fuscus* in 1989.

insufficiently detailed; a few were eliminated because it was not clear that nursery colonies had previously existed; and others had to be eliminated because owners were non-cooperative or could not be found.

Direct observation was used to determine whether the colonies were presently active. Landowners or residents were consulted in an attempt to determine how long defunct colonies had been inactive and why they became inactive.

RESULTS AND DISCUSSION

A total of 128 bat colonies that had been active in 1959 was revisited in the summer of 1989, 95 of *Eptesicus*, 27 of *Myotis lucifugus*, 5 of *Nycticeius*, and 1 of *Pipistrellus*. Of these, 21 (22.1%) of the *Eptesicus* colonies and 8 (29.6%) of the *M. lucifugus* colonies were still active (Table 1). All *Nycticeius* and *Pipistrellus* colonies were inactive in 1989. All of the buildings previously occupied by *Nyticeius* were gone. Two of the buildings previously inhabited by *Myotis lucifugus* are now inhabited by *Eptesicus fuscus*. Overall, 29 of the 128 colonies or 22.7% were still active, not including the 2 in which one species had been replaced by another. Thus in 30 years, 99 or about 3/4 of the colonies had become inactive.

In 59 of the 99 sites which no longer harbored bats of the original species, the original species, the reason for leaving was obvious. In 11 cases, the buildings involved

had burned, and in an additional 32 cases, the buildings otherwise were gone, i.e., they had been torn down, or in some instances blown or fallen down. In 9 cases the bats had been built out, and in 7, extermination attempts had taken place (4 of these were in churches). One colony had apparently moved (from a barn) to a nearby house, although the reason for that was not clear; thus, this colony is included with those which have left, but for which there was no obvious reason.

There were 40 buildings still standing with no bats but in which there was no obvious reason why bats were no longer present. To us they appeared perfectly capable of supporting bats. In none of these cases was there any sign of disturbance that should have caused the bats to leave. Thus, even if left alone, it appears that many colonies disappear occasionally. Buildings still standing and still harboring colonies were 21 with *Eptesicus fuscus,* 8 with *Myotis lucifugus* and the 2 originally with *M. lucifugus* but now with *E. fuscus*. Thus only 31 of 71 (43.7%) buildings still standing in 1989 harbored bats.

Barns harbored 80 of the original colonies of bats, 71 of 95 of the *Eptesicus* colonies (74.7%), 8 of 27 of the *Myotis lucifugus* colonies (29.6%), and the *Pipistrellus* colony. These colonies were reduced about 75% in the 30 years, about average for the overall study. Twenty-five of the colonies were in houses, 9 of *Eptesicus* (9.5% of the 95), 11 of *Myotis lucifugus* (40.7% of the 27), and all 5 of the *Nycticeius* colonies. Again in *Eptesicus* and *M. lucifugus* these were reduced by about 75%. There were only 11 churches in the original sample, and 3 (27.2%) are still inhabited, again nearly the overall average.

Also, we collected information, when available, on when colonies disappeared (i.e., when the building was torn down, etc.). Data were available for 63 of the 99 colonies no longer in existence; we could not get a reliable estimate in the other 36. The fact that 99 colonies disappeared in 30 years indicates that about 3.3% of the colonies disappeared per year. Dates of disappearance for the 63 known colonies, summarized by five year periods, is 1960-64 (4 colonies), 1965-69 (7), 1970-74 (14), 1975-79 (16), 1980-84 (16), and 1985-89 (6).

ACKNOWLEDGMENTS

We thank the Indiana Academy of Science and the Indiana Department of Natural Resources for financial aid for this project.

LITERATURE CITED

Cope, J.B., W.W. Baker and J. Confer. 1961. Breeding colonies of four species of bats of Indiana. Proc. Ind. Acad. Sci. 70:262-266.