# Mammals of Pulaski County, Kentucky

David J. Fassler
University of Kentucky, Somerset Community College, Somerset, Kentucky 42501[1]

Abstract

A survey of the native mammals of Pulaski County, Kentucky, was made between 15 January 1971 and 1 July 1973. During that period, 33 species of mammals were collected, 4 species were observed but not collected, and 13 species remain in questionable status. Notes on reproduction, morphology, distribution, and ecology are given for certain species.

## Introduction

Few specific areas have been thoroughly studied to determine the status of the native mammalian fauna in the Commonwealth of Kentucky. The most notable study of any location was by Barbour (1951) on Big Black Mountain in Harlan County. Most other studies of mammalian distribution were aimed at a given genus or species. This summary of information on the mammalian fauna of Pulaski County is based on more than 300 specimens gathered from 15 January 1971 to 1 July 1973. The majority of those specimens are in my personal collection, or have been deposited at Morehead State University, Western Kentucky University, or Eastern Kentucky University.

Pulaski County is a politically defined area of 243 km$^2$ in south-central Kentucky. The Cumberland River, which bisects the southern part of the county, was dammed in 1951, to form Lake Cumberland. Elevations above mean sea level within the county range from 220 m at normal pool level of Lake Cumberland to 513 m on the summit of Green River Knob.

Geologically, the eastern portion of the county lies on the Cumberland Plateau, an area characterized by Pennsylvanian shales and sandstones. The western part of the county consists of Mississippian limestones. The eastern portion of the county is hilly; the western part is more gently rolling. A more detailed analysis of the county has been treated by Lewis (1974).

The county has a predominantly mixed mesophytic forest association (Oosting 1956). The county has acidic sandstone-derived soils in the east and alkaline limestone-derived soils in the west. Hemlock (*Tsuga canadensis*), pines (*Pinus* spp.), mountain laurel (*Kalmia* sp.), and buckeye (*Aesculus octandra*) are predominant in the sandstone areas, and hackberry (*Celtis occidentalis*) and black locust (*Robinia pseudo-acacia*) are predominant in the limestone areas. Beech (*Fagus grandifolia*), magnolia (*Magnolia grandiflora*), yellow poplar (*Liriodendron tulipifera*), red maple (*Acer rubrum*), hickory (*Carya* spp.), and oaks (*Quercus* spp.) occur in both areas. Sycamore (*Plantanus occidentalis*) occurs throughout the county, but is typically hydrophytic. In those areas where the hardwood trees have been removed, the terrain usually is covered with stands of fescue (*Festuca* spp.).

Scientific nomenclature follows Barbour and Davis (1969) for the Chiroptera and Hall and Kelson (1959) for all other orders.

## Acknowledgments

I am especially indebted to the following people for their assistance in locating specimens: Delmos Sumner, Richard Q. Lewis, Sr., Wendell Cornett, Larry Hranicky, Larry Adkins, Mark Eubank, Billy C. Clark, Napier Hines, Luther Small, and Ernest Daulton. Mr. Richard Q. Lewis, Sr. of the U.S. Geological Survey assisted on collecting trips, provided geological information, and made critical comments concerning the manuscript. Mr. Richard Drabik assisted in producing Fig. 1. Dr.

[1] Current address: Prudential Insurance Company, 621 South 10th Street, Bozeman, Montana 59715.

Wayne H. Davis made several helpful suggestions leading to the final preparation of the manuscript.

Part of this study was funded by grant number 102-01-5W100-00000-304 of the University of Kentucky.

## THE MAMMALS

*Didelphis marsupialis* (Kerr), opossum.

The opossum is found in all parts of the county and specimens were collected from 7 locations. A female killed in Somerset on 28 June 1972 contained 9 joeys, 56 mm in crown–rump length. A female captured on 16 April 1973 contained 9 joeys, which were weaned by 14 May 1973.

*Sorex fumeus* (Miller), smoky shrew.

A partially mutilated adult was obtained on 27 September 1971 at the Somerside Acres subdivision between Somerset and Burnside, having been caught by a house cat. The shrew presumably lived in the open fields near the subdivision. Moist areas such as those preferred by this shrew are not close to the subdivision.

*Cryptotis parva* (Say), least shrew.

Five least shrews, caught by house cats in the city of Somerset, were collected in March, July, October, and December. A female found on 3 July 1972 contained 5 embryos, 9 mm in crown–rump length. This shrew probably is common in open fields throughout the county.

*Blarina brevicauda* (Gapper), short-tailed shrew.

This shrew is frequently the prey of house cats. Specimens were collected during all months except January, February, and September. This animal is frequently confused with a young mole by the local residents.

*Scalopus aquaticus* (Linnaeus), eastern mole.

The eastern mole probably is ubiquitous in well-drained soils throughout the county. About 10 percent of my specimens contained patches of white on the venter.

*Parascalops breweri* (Bachman), hairy-tailed mole.

One badly mutilated, but identifiable, road-killed *P. breweri* was observed near Plato in northeastern Pulaski County.

*Plecotus rafinesquii* (Leeson), Rafinesque's big-eared bat.

Fassler (1971) reported this bat to be common in Pulaski County. Specimens have been collected at Sloan's Valley Cave, an unnamed cave 7.7 km east-southeast of Somerset, and at an abandoned house 3.2 km west-southwest of Ingle that was occupied by a nursery colony of more than 50 females with their young.

*Nycticeius humeralis* (Rafinesque), evening bat.

Fassler (1973) reported collecting of an adult male 3.2 km south-southeast of Jugornot on 18 April 1972.

*Lasiurus borealis* (Muller), red bat.

Red bats have been collected or observed throughout the year. On warm winter days, this animal can be seen flying about in the late afternoon. Davis and Lidicker (1956) reported similar winter behavior in this bat. A male red bat was found hibernating in an abandoned woodpecker hole near Gregory in adjacent Wayne County, Kentucky (Fassler 1974).

*Lasiurus cinereus* (Palisot de Beauvois), hoary bat.

Fassler (1972) reported finding a male hoary bat in Somerset on 13 November 1971. The specimen was unique because of its rarity in the Commonwealth and its late autumn arrival.

*Lasionycteris noctivagans* (Le Conte), silver-haired bat.

Barbour and Davis (1969) stated that the silver-haired bat is a common migrant in Kentucky during March and April. This species was observed in flight on 1 November 1972. On 14 March 1973, a nonpregnant female was found in a vertical

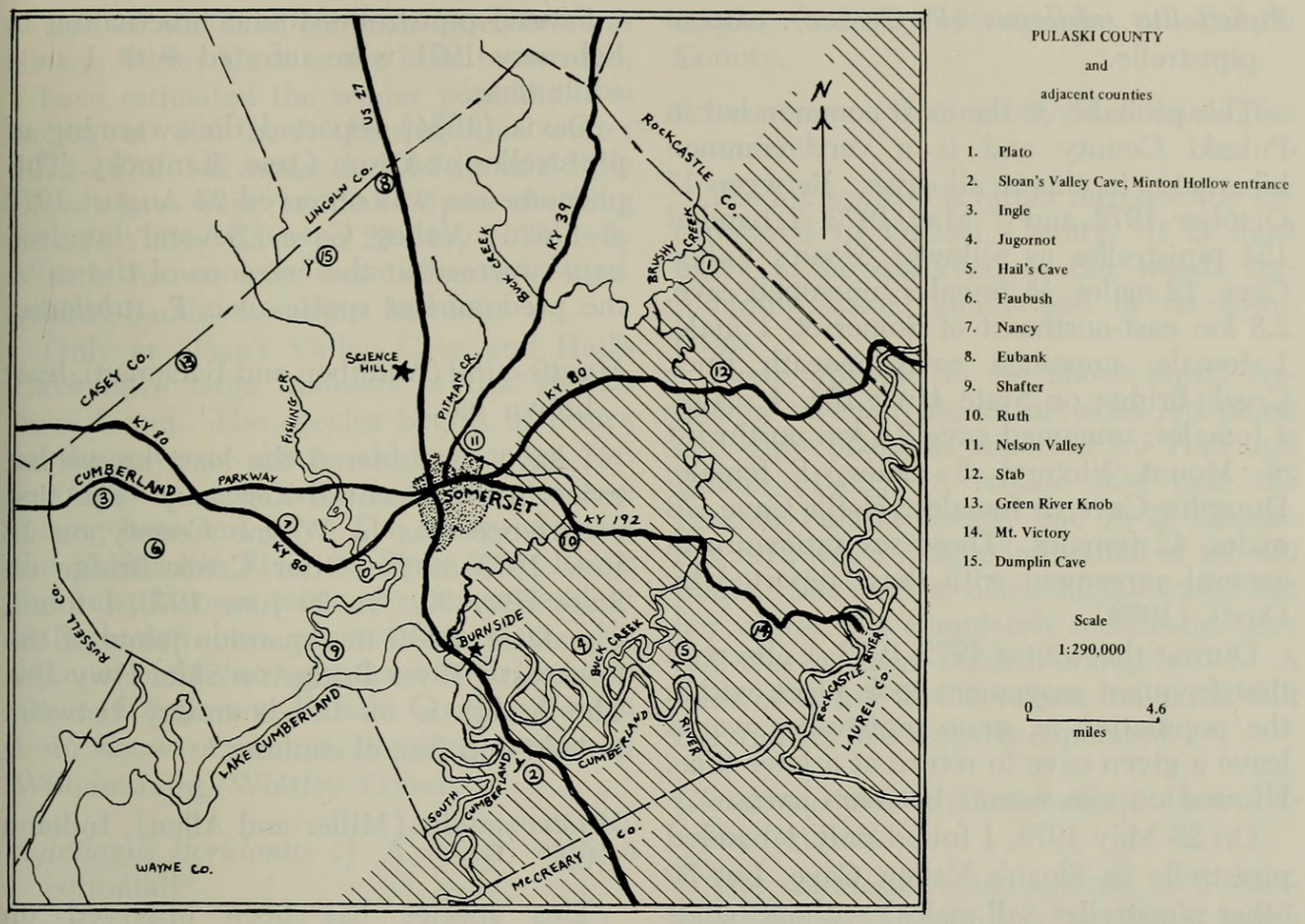


FIG. 1. Map of Pulaski County showing important physiographic features. The area of the Cumberland plateau is cross hatched.

crevice just inside Hail's Cave. On 15 April 1973, another nonpregnant female was shot 3.2 km south-southwest of Jugornot. The latter animal may have been a late migrant that year due to record low temperatures in early April.

*Eptesicus fuscus* (Palisot de Beauvois), big brown bat.

During the summer months, I estimated the presence of more than a million big brown bats in nursery colonies in Somerset, but I have been unable to find this species in the same buildings during winter. In the winter of 1972–1973, only 5 male and 11 female big brown bats were found in Pulaski County caves that I examined. The winter disappearance of this species is not unique to Pulaski County since John Whitaker (pers. comm.) has reported the phenomenon in west-central Indiana.

The big brown bat begins to appear at its nursery colonies during the latter part of April, and the young usually are born the first week in June. By early July, the young are capable of fending for themselves. On an afternoon in early July 1972, more than 300 juveniles were found clinging to the side of a house at 124 Bourne Avenue, Somerset. Upon observing the phenomenon, I noticed that as the juveniles tried crawling to the entrances leading to the attic, they were promptly turned away by the adults. By the next morning, most exiled juveniles were gone.

There are several places in Somerset where *E. fuscus* is found inhabiting chimneys; I do not know, however, if this species coexists with the Chimney Swift (*Chaetura pelagica*).

A single female big brown bat shared a rafter with a colony of *P. rafinesquii* in the abandoned house 3.2 km west-southwest of Ingle.

*Pipistrellus subflavus* (F. Cuvier), eastern pipistrelle.

This probably is the most common bat in Pulaski County and is a very common hibernator in almost all caves. Between 17 October 1972 and 7 May 1973, I banded 154 pipistrelles as follows: Sloan's Valley Cave, 12 males, 11 females; unnamed cave, 2.8 km east-northeast of Somerset, 1 male, 1 female; unnamed cave beneath Buck Creek Bridge on State Hwy 192, 4 males, 4 females; unnamed cave 2.4 km northwest of Mount Victory, 3 males, 1 female; Dumplin Cave, 2 females; Hail's Cave, 73 males, 42 females. These sex ratios are in general agreement with those reported by Davis (1959).

During the winter 1972–1973, I observed that frequent movement took place within the population as some pipistrelles would leave a given cave to return at a later time. I found no movements between caves.

On 25 May 1973, I found only 1 banded pipistrelle in Sloan's Valley Cave, but 50 other pipistrelles (all males) without bands were also present. The summer distribution of the many banded pipistrelles has not been established.

I have shot pipistrelles on only a few occasions. A female was shot on 20 June 1972, 3.2 km south-southeast of Jugornot. She was pregnant with 2 embryos, 23 mm in crown–rump length. A male was shot at the same location on 6 September 1972. On 26 June 1972, a *P. subflavus* was observed fluttering like a moth around a mercury vapor lamp at a house 0.5 km east of Ruth. On 4 June 1973, at least 24 pipistrelles were seen fluttering above a mercury vapor lamp 1.6 km north of Somerset; a single male was shot.

On 22 February 1973, the carcass of a pipistrelle was found at the entrance of an unnamed cave beneath the Buck Creek Bridge on State Hwy 192. The carcass was on a rock ledge near the entrance of the cave with 2 owl pellets containing the remains of a *Microtus* nearby. I surmised that the bat probably was killed by an owl.

Several pipistrelles found hibernating in February 1971 were infested with 1 to 4 adult ticks.

Davis (1964) reported the swarming of pipistrelles at Dixon Cave, Kentucky. This phenomenon was observed 23 August 1972 at Sloan's Valley Cave. Several hundred bats swarmed at the entrance of the cave; the predominant species was *P. subflavus*.

*Myotis leibii* (Audubon and Bachman), least brown bat.

I have encountered the least brown bat twice in south-central Kentucky. The first occurrence was in Wayne County on 18 June 1973 at the Otter Creek Bridge on State Hwy 90. On 29 June 1973, I found 2 male *M. leibii* in expansion joints of the Rockcastle River Bridge on State Hwy 192. The bridge is on the boundary between Pulaski and Laurel counties.

*Myotis sodalis* (Miller and Allen), Indiana bat.

This species has been observed on occasion in Sloan's Valley Cave and Hail's Cave. Increasing disturbances by man may be a factor in the demise of the Indiana bat. On several occasions, I have entered Sloan's Valley Cave and found vandals throwing rocks at hibernating clusters of bats. At other times, the smoke from spelunker's fires has so completely filled several passages that hibernating bats have aroused and left the caves.

*Myotis keenii* (Merriam), Keen's bat.

This species is rather rare in Pulaski County. Specimens have been collected during March at an unnamed cave 5.6 km south of Hail, and during June and August at Sloan's Valley Cave. During the winter of 1972–1973, only 4 *M. keenii* were banded.

This species was most frequently encountered at Sloan's Valley Cave during the swarming activities in late summer. It ranked second after *P. subflavus* in numbers seen.

*Myotis lucifugus* (Le Conte), little brown bat.

One of our most common hibernators at Sloan's Valley Cave is the little brown bat; I have estimated the winter population in excess of 300 bats. During the winter 1972–1973, 142 male and 64 female little brown bats were banded. Upon checking Sloan's Valley Cave on 25 May 1973, only 8 little brown bats were observed; 4 exhibited bands, the others had left.

Only at Sloan's Valley Cave and Hail's Cave have large numbers of this species been found. The species begins to return to the caverns about mid-September. *M. lucifugus* has only rarely been taken or seen during June and July. The bridge crossing the Rockcastle River on State Hwy 192 is the most favored roost of summer resident little brown bats observed to date. No colonies of *M. lucifugus* have been found in attics of houses in Pulaski County, though I do know of such a situation in nearby Williamsburg, Whitley County.

*Sylvilagus floridanus* (J. A. Allen) eastern cottontail.

This rabbit is rather common and widespread throughout the entire county. During the summer of 1972, an eastern cottontail that became a "pet" at Somerset Community College was observed with 4 litters. The young were born in mid-March, early May, late June, and mid-August.

*Marmota monax* (Linnaeus), woodchuck.

The woodchuck is a very common resident in all parts of Pulaski County. Juvenile woodchucks taken on 9 April 1972 and 5 May 1973 were having their permanent premolars erupt though the deciduous premolars were still present.

*Tamias striatus* (Linnaeus), eastern chipmunk.

Both subspecies of chipmunks, *T. s. striatus* and *T. s. ohioensis*, are found in Pulaski County.

*Sciurus carolinensis* (Gmelin), gray squirrel.

The gray squirrel is a very common inhabitant of the hickory, oak, dogwood, maple, and walnut forests of Pulaski County.

*Sciurus niger* (E. Geoffroy St. Hilaire), fox squirrel.

The fox squirrel is rather infrequently encountered in Pulaski County. It is most likely to be observed in the woods surrounding Lake Cumberland or its tributaries.

There appears to be about equal frequency of color phases between red phase and gray phase as reported by Hall and Kelson (1959). A female shot near the Lincoln–Pulaski County line on 28 December 1972 was a mosaic individual of the red phase. She had a black facial wash, but her venter was completely melanistic. Her tail was a deep reddish-orange color. A mass of sperm in the vagina indicated that the squirrel had recently copulated.

*Glaucomys volans* (Linnaeus), southern flying squirrel.

The southern flying squirrel is a common resident inhabiting hollow snags, beech trees, attics, and birdhouses. A female found in a birdhouse 3.2 km east of Burnside on 14 May 1973 had 2 young, 172 and 165 mm in total length. The juveniles were capable of gliding on their own and ate limited quantities of beef liver. I suspect the young were about to be weaned.

*Castor canadensis* (Kuhl), beaver.

Beavers were natives of Pulaski County before their extermination by fur trappers. Today, a few beaver are found in the Beaver Creek drainage as the Fish and Game Commission tried to reestablish the animal in its former range.

*Peromyscus leucopus* (Rafinesque), white-footed mouse.

This species is the dominant species of *Peromyscus* in Pulaski County. I have taken it in all habitats, open fields, dense forests, along streams, and dense brush. A female captured on 13 February 1973 contained 4 embryos, 18 mm in crown–rump length. *P. leucopus* shows varying degrees of polymorphism within the population.

*Neotoma floridana* (Ord), eastern wood rat.

Wood rats are locally abundant in Pulaski County. I have collected specimens from 2.1 km southeast of Somerset. I have also seen *N. floridana* in Hail's Cave and in an abandoned house south of Burnside.

*Microtus ochrogaster* (Wagner), prairie vole.

The occurrence of the prairie vole in Pulaski County represents a slight range extension from that given by Hall and Kelson (1959). This species has been found at Mill Springs National Cemetery in Nancy, 1.6 km east of Science Hill, and 2.1 km southeast of Somerset. A female caught at Mill Springs National Cemetery on 29 April 1972 had 5 embryos, 3 were 10 mm in crown–rump length while 2 were being reabsorbed.

*Microtus* (*Pitymys*) *pinetorum* (Le Conte), pine vole.

Two subspecies of the pine vole occur in Kentucky with the type specimen of *M. p. carbonarius* being reported by Handley (1952) from Eubank. I have collected specimens of presumably *M. p. carbonarius* from 3 locations in Pulaski County.

*Ondatra zibethicus* (Linnaeus), muskrat.

The muskrat is a common inhabitant of the small rivers, streams, and ponds in Pulaski County. Even though the amount of fur trapping in recent years has diminished, several hundred muskrats are still caught by the few remaining professional trappers.

*Synaptomys cooperi* (Baird), southern bog lemming.

The range map of Hall and Kelson (1959) excludes the southern bog lemming from Pulaski County. Barbour (1956) described a new subspecies, *S. c. kentucki*, from north-central Kentucky, the nearest record occurring in Richmond, Madison County. *S. c. stonei* has its closest occurrence at Goldbug, Whitley County. I have collected 2 specimens of *S. cooperi* from 1.6 km east of Science Hill. A specimen collected on 5 November 1972 was a female containing 2 embryos, 10 mm in crown–rump length. The animals were found on a wooded knob with scattered areas of dense undergrowth.

*Zapus hudsonicus* (Zimmerman), meadow jumping mouse.

Wallace (1971) reported the presence of *Z. hudsonicus* from Lyon, Oldham, Daviess, and Madison counties.

In October 1971, a resident near Pitman Creek at Ruth reported seeing a mouse that jumped and had a long tail, but I was unable to obtain any by trapping. On 14 May 1973, I was presented a specimen of this species caught at Nelson Valley, 3.2 km north of Somerset on State Hwy 39. The area is a bottomland along Pitman Creek, 7.2 km by air northwest of Ruth. I suspect that additional jumping mice may be caught between Ruth and Nelson Valley along Pitman Creek.

*Vulpes fulva* (Desmarest), red fox.

The red fox is rather rare in Pulaski County. The few animals seen usually are present in the more heavily forested portions of the county.

*Urocyon cinereoargenteus* (Schreber), gray fox.

This species is very common throughout the country. The animals prefer to hunt in the open fields with nearby woods into which they can retreat. Several hundred of these mammals are killed yearly by automobiles in Pulaski County. This species frequently is a vector for rabies, and in adjacent Casey County, the rabies virus has eliminated a number of these animals. There have been no recent reports in Pulaski County of rabid gray foxes.

*Procyon lotor* (Linnaeus), raccoon.

The raccoon is frequently observed at night along the larger streams in the county. In the summer, raccoons frequently invade corn fields to feed on the young succulent ears of corn.

*Mustela vison* (Schreber), mink.

Local fur trappers encounter the mink along the several tributaries to Lake Cumberland, and even in swampy and marshy areas. Mink frequently are the casualty of automobiles on major highways. I have collected specimens from north of Somerset and south of Eubank and have also seen mink in the forest east of Mt. Victory.

*Mephitis mephitis* (Schreber), striped skunk.

This skunk lives in the flat open areas of Pulaski County. I collected a specimen from 1.6 km east of Somerset. I suspect that trophic competition between the striped skunk and the opossum may be a restricting factor in the abundance of the skunk.

*Odocoileus virginiana* (Zimmerman), white-tailed deer.

This species is hunted locally, with most kills occurring in southern Pulaski County. The number of animals present would be greatly enhanced if out-of-season hunting was reduced and if feral dog packs were eliminated. Certain parts of the county produce extensive browse conducive to the well-being of white-tailed deer.

## MAMMALS OF QUESTIONABLE OCCURRENCE

The presence of 13 species of mammals in Pulaski County remains indefinite. I found no evidence to indicate the presence of *Sorex longirostris* (southeastern shrew), *Sylvilagus aquaticus* (swamp rabbit), *Oryzomys palustris* (marsh rice rat), *Reithrodontomys humulis* (eastern harvest mouse), *Peromyscus maniculatus* (deer mouse), *Peromyscus* (*Ochrotomys*) *nuttalli* (golden mouse), *Sigmodon hispidus* (hispid cotton rat), *Microtus pennsylvanicus* (meadow vole), and *Spilogale putorius* (eastern spotted skunk).

*Myotis grisescens* (gray bat) lives in nursery colonies in nearby Adair and Garrard counties. This bat prefers caves with a good flow of water, several of which occur in Pulaski County.

*Ursus* (*Euarctos*) *americanus* (black bear) was supposedly seen by several residents in the Stab community in 1971. However, a search for clues concerning the presence of a bear proved fruitless.

*Mustela frenata* (long-tailed weasel). In talking with local trappers, the last known weasel caught was 5 or 6 years ago. Local poultry specialists have not had recent reports of weasels raiding chicken houses.

## LITERATURE CITED


BARBOUR, R. W. 1951. The mammals of Big Black Mountain, Harlan County, Kentucky. J. Mammal. 32:100–110.

———. 1956. *Synaptomys cooperi* in Kentucky, with description of a new subspecies. J. Mammal. 37:413–416.

———. 1957. Some additional mammal records from Kentucky. J. Mammal. 38:140–141.

———, AND W. H. DAVIS. 1969. Bats of America. University Press of Kentucky, Lexington, Ky. 286 pp.

DAVIS, W. H. 1959. Disproportionate sex ratios in hibernating bats. J. Mammal. 40:16–19.

———. 1964. Fall swarming of bats at Dixon Cave, Kentucky. Bull. Natl. Speleolog. Soc. 26:82–83.

———, AND W. Z. LIDICKER, JR. 1956. Winter range of the red bat, *Lasiurus borealis*. J. Mammal. 37:280–81.

FASSLER, D. J. 1971. A range extension of Rafinesque's big-earred bat in Kentucky. Bat Res. News 12:41.

———. 1972. An additional record of the hoary bat in Kentucky. Trans. Ky. Acad. Sci. 34:36.

———. 1973. An additional evening bat from south-central Kentucky. Trans. Ky. Acad. Sci. 34:46.

———. 1974. Red bat hibernating in a woodpecker hole. Amer. Midl. Nat. In press.

HALL, E. R., AND K. KELSON. 1959. The Mammals of North America. The Ronald Press Co., New York, N.Y. 2 vols.

HANDLEY, C. O., JR. 1952. A new pine mouse (*Pitymys pinetorum carbonarius*) from the southern Appalachian Mountains. J. Wash. Acad. Sci. 42:152–153.

LEWIS, R. Q., SR. 1974. Geologic map of the Somerset quadrangle, Pulaski County, Kentucky. U.S. Geol. Survey Geol. Quad. Map. G.Q. In press.

OOSTING, H. J. 1956. The study of plant communities. W. H. Freeman Co., San Francisco, Calif. 440 pp.

WALLACE, J. T. 1971. New records of *Zapus hudsonicus* (Zimmerman) from Kentucky. Trans. Ky. Acad. Sci. 32:65–69.