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Survey of Some Eastern Iowa Caves for Wintering Bats

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Nineteen caves in the eastern Iowa counties of Dubuque, Jackson, and Jones were surveyed for bat usage during the winter of 1983-84. A total of 1548 hibernating bats of 4 species (*Myotis lucifugus*, *Myotis keenii*, *Pipistrellus subflavus*, and *Eptesicus fuscus*) were counted in 12 of the caves. Only the previously reported federally endangered *Myotis sodalis* was not found.
INDEX DESCRIPTORS: Iowa, caves, bats, hibernacula.

It has long been known that 5 of Iowa's bat species hibernate during the winter in caves, mines, and other cavernous structures in eastern Iowa (Tables 1, 2). Aside from the 1958-59 Dubuque area winter study by Muir and Polder (1960), records of hibernating bats have been inconsistently documented. Some cavers, notably Stewart Peck and James Hedges, kept records, and the Quint City Grotto Newsletter noted observations on bats from 1958 to 1961. Nixon Wilson (University of Northern Iowa) and Bowles banded hibernating bats in Searryl's Cave (Jones County), Dance Hall Cave (Jackson County), and Yew Ridge Cave (Dubuque County) from 1971 to 1973. Since 1980, Pruszko has explored and mapped many caves and mines in the Dubuque area and recorded data on bat usage.

Our survey was conducted to seek current population data on hibernating bats in previously reported sites in Dubuque, Jackson, and Jones Counties, and to locate unreported hibernacula. In particular, winter data were sought on the federally endangered Indiana bat, *Myotis sodalis* Miller and G. M. Allen. Previous records of *M. sodalis* include 2 females from Yew Ridge Cave in 1973 (Wilson, pers. comm.) and the 3 males reported from Becker's Quarry [South] (Muir and Polder 1960).

METHODS

The 19 caves chosen for this study represent a range of types and locations. Factors considered included previous reports of bats, number of entrances and type (vertical/horizontal), proximity to water, and amount of human disturbance. Except where noted, the caves surveyed were either natural or virtually unaltered by lead or zinc mining, hence are all termed "caves." While we give general descriptions of selected caves herein, details are contained in the files of the Iowa Grotto and the National Speleological Society.

Bats were identified as specifically as possible and either counted or numbers estimated. Individuals within easy reach were not disturbed except to verify identity and we spent as little time as possible where bats were located. The general distance of each species from the entrance was noted as well as temperature, relative humidity, and presence or absence of air movement. One visit was made to each cave between 30 December 1983 and 3 March 1984.

RESULTS

We counted 1548 bats of 4 species in 12 of the 19 caves surveyed (table 3). As with previous surveys, the big brown bat, *Eptesicus fuscus* (Palisot de Beauvois) was the most abundant bat, roosting closer to entrances than the other species and in larger clusters (up to 200). We found it in 7 of the caves sampled. The little brown bat, *Myotis lucifugus* (Le Conte) was a distant second in abundance and found in 5 caves, usually well within the interior, roosting singly or in small

clusters. We located the eastern pipistrelle, *Pipistrellus subflavus* (F. Cuvier), in 9 caves, always roosting singly and well within the cave. While only 3 Keen's bats, *Myotis keenii* (Merriam), were identified in our survey, we probably overlooked some because of efforts to minimize disturbance. Similarly we could easily have missed those few *M. sodalis* that may have remained north of their major hibernacula.

Table 1. Cavernous structures (mostly caves) in eastern Iowa counties from which hibernating bats have been recorded as summarized from a variety of sources.¹

County	Cave/Mine etc.	Species
Clayton	Silica Mine	unidentified
	Spook	PISU
Delaware	Backbone	PISU
Des Moines	Starr's	EPFU, MYKE, MYLU, PISU
Dubuque	Becker's Quarry	EPFU, MYLU, MYSO, PISU
	Bill Board #1 ²	EPFU, PISU
	Bronze Bottom	EPFU
	Crystal Lake	EPFU, MYLU
	Durango West ³	MYLU, PISU
	Ewing Diggings	unidentified
	Julien ⁴	PISU
	Simpson Furnace	EPFU
	Timmon's	MYKE, MYLU, PISU
	Yew Ridge	EPFU, MYKE, MYLU, PISU
Jackson	Ciro's ⁵	PISU
	Dance Hall	EPFU
	Hatfield	EPFU
	Hunter's	MYKE
	Maquoketa ⁶	EPFU, PISU
Jones	Oak	unidentified
	Rainy Day	unidentified
	Searryl's	EPFU, MYKE, MYLU, PISU
	Ft. Madison ⁷	
Lee	wine cellar	EPFU

¹Bowles (1975), J. Hedges (pers. comm.), Pruszko (unpublished data), Quint City Grotto Newsletter 1958-61, and Wilson and Bowles (unpublished banding data).

²⁻⁷Alternate cave names: ²Hill Street Dave or Royce and Frost Mine. ³Drybone #3. ⁴Unknown to us. ⁵Probably Searryl's. ⁶Specific cave not identified. ⁷Name unknown to us.

⁸Species of bats: EPFU = *Eptesicus fuscus*, MYKE = *Myotis keenii*, MYLU = *Myotis lucifugus*, MYSO = *Myotis sodalis*, PISU = *Pipistrellus subflavus*.

Table 2. Caves in Iowa from which bats have been recorded during times other than in hibernation or times were not specified.

County	Cave/Mine etc.	Species ¹
Fayette	Dutton's	PISU
Hardin	Rattlesnake	MYKE, PISU
Jackson	Oak	unidentified
	Rainy Day	unidentified
	Worden's	MYLU, PISU
	Wye	PISU
Jones	Bogus	unidentified
Winneshiek	Ice Cave	PISU
	Kendelville ²	EPFU, MYLU, PISU

¹See Table 1 for species abbreviations.

²Name unknown to us.

la (LaVal and LaVal 1980, Clark et al., in prep.).

Below, in alphabetical order, we give brief descriptions and data for those caves we consider to be important actual or potential bat hibernacula surveyed by us in 1983-84, or have been reported as hibernacula in the past. Totals for all 19 caves are summarized in Table 3.

Becker's South Quarry (Dubuque Co.)

This cave was mined on several levels and has 4 entrances (3 horizontal, 1 vertical). Ceiling height in the main passage reaches about 15 m in places, side passages vary from "crawl" to "walking" size. Although quite dry, there was some water dripping from the ceiling and an air current along the main passage. Few persons visit this cave because of sensitive land owner relationships.

We found 22 *M. lucifugus*, 6 *P. subflavus*, and 14 *E. fuscus* in the main passage. While numbers of *M. lucifugus* and *P. subflavus* are comparable to the 21 and 4 reported by Muir and Polder (1960), they also found 172 *E. fuscus* and 3 *M. sodalis*. Since this cave is rarely visited, we have no adequate explanation for our lower numbers of *E. fuscus*. We did not census the side passages but doubt if they were examined in the earlier census either. It is interesting that neither of us located any *M. keenii* although the species uses the cave as a summer roost, along with *E. fuscus* and *M. lucifugus* (Clark et al., in prep).

Billboard #1 (Dubuque Co.)

This cave, also known as Hill Street Cave, was mined in the past as the Royce and Frost Mine. There is a single horizontal entrance and the dry main "walking" passage connects 4 m high ceiling domes. There are 2 "crawl-sized" side passages and no obvious air flow in the cave.

Although Muir and Polder (1960) found 28 *E. fuscus* and 2 *P. subflavus* in 1959, Pruszko located only 2 of the latter in 1982. We found no bats in our survey. Visitors frequent this cave and the soot on the ceiling suggests disturbance to the bats.

Crystal Lake (Dubuque Co.)

This commercial cave is open from May to September. It has 2 horizontal entrances, each covered with a door, and a slight air current throughout. The generally dry "walking" sized main passage is about 900 m long but there was some water seeping from the ceiling. The back passages, about 2 m high, are not included in the commercial tour so rarely are visited.

Although Muir and Polder (1960) reported 131 *E. fuscus* and 4 *M. lucifugus* here, we found no hibernating bats, probably reflecting its commercial use and effect of gate placement on air flow.

Dance Hall (Jackson Co.)

This major cave in Maquoketa Caves State Park has a cemented

Table 3. Summary of bat data for eastern Iowa hibernacula surveyed during winter 1983-84, in descending order of abundance.¹

Cave	County	Species ²					TOTAL
		EPFU	MYKE	MYLU	PISU	UNID.	
Searryl's	Jones	295	2	16	51	232	596
Hatfield	Jones	399			2		401
Dance Hall	Jackson	330					330
Maus Park #4 ³	Dubuque			100			100
Becker's Quarry	Dubuque	14		22	6		42
Durango E.							
Drybone ³	Dubuque	22		9	1		32
Durango W.							
Drybone #1 ³	Dubuque		1	18	3		22
Lockey E.							
Drybone ³	Dubuque	11			1		12
Simpson Furnace	Dubuque				8		8
Becker N.							
Quarry ³	Dubuque				2		2
Brewery Cellar ³	Dubuque	2					2
Maus Park #2 ³	Dubuque				1		1
Total		1073	3	165	75	232	1548

¹Caves examined in which we found no bats: Billboard #1, Billboard #2³, Crystal Lake, Durango West Drybone #2³, Finley's Landing³, all Dubuque County; Hunter's (Jackson County).

²See Table 1 for species abbreviations.

³Caves for which we have no previous data.

walking passage and ceiling height ranging from about 2 to 10 m. There is a stream along the passage and 3 entrances (2 horizontal and 1 central vertical sink hole). Since the cave is quite open, there was air movement along the main passage. To our knowledge, this cave was not mined but has been frequently visited for many years. Flooding in spring 1983 blocked the main passage.

In 1983-84, we found 330 *E. fuscus* in the main passage, including a cluster of 150. This is fewer than the 438 (254 males, 184 females) banded in 1972 by Wilson and Bowles (unpubl. data).

Durango East Drybone (Dubuque Co.)

Like several caves in the vicinity, this one has a horizontal entrance on either end of a main passage that goes through a hill. Along the passage are 2 big rooms formed by ceiling collapses and numerous vertical shafts. There was an air current, but human usage seemed minimal.

We located 9 *M. lucifugus*, 1 *P. subflavus*, and 22 *E. fuscus*, and know of no previous bat census here.

Durango West Drybone #1 (Dubuque Co.)

Located in an adjacent hill to Durango East Drybone, this mined cave has a single vertical entrance and many rooms (1-2 m high) on 2 levels, interconnected by multiple passages 1 m or less in height. The cave was dry and dusty, and without noticeable air current.

In this survey, we found 18 *M. lucifugus*, 1 *M. keenii*, and 3 *P. subflavus*, but no *E. fuscus*. We know of no other bat survey here.

Hatfield (Jones Co.)

The entrance of this unmined cave is horizontal and located a short distance from the Maquoketa River. The main passage is of "walking" height with side rooms up to 8 m high. The cave was quite dry but had some water dripping from the ceiling. Although of historical interest because of Indian artifacts, this cave rarely is visited because of its remoteness.

Hatfield was one of the most important bat hibernacula censused by us in 1983-84. We found 399 *E. fuscus* along with 2 *P. subflavus*, and Pruszko located 250 of the former in spring 1983. We know of no previous winter census of this cave.

Maus Park #4 (Dubuque Co.)

This is one of several similar mined caves that open horizontally on the bluff facing the Mississippi River. There is a single "stoop-sized" passage. The cave was fairly dry except for some dripping ceiling water, and there was no noticeable air current. Because of the steep hillside and thick vegetation, these bluff caves rarely are visited.

Based on the 100 *M. lucifugus* found here, we assume this cave to be an important hibernaculum for that species. We also found *M. lucifugus* here in the fall and, judging by the distribution and amount of guano, assume it to be an important migration roost as well. The greater length and warmer, more stable temperature in this cave provide hibernation conditions not found in Maus Park caves numbers 2 and 5, although those may be used during migration.

Searryl's (Jones Co.)

This unmined cave has a single horizontal entrance to the main passage which varies from "crawl" to "walking" height and connects two domed rooms, approximately 15 m and 20 m wide. The cave was quite wet and there was standing water along much of the main passage. Although known to cavers, this cave seldom is visited.

We consider Searryl's Cave to be one of the most important bat hibernacula in Iowa. During our 1983-84 visit, 597 bats were

counted, of which 16 were *M. lucifugus*, 2 *M. keenii*, 51 *P. subflavus*, 295 *E. fuscus*, and 232 not specifically identified, although we believe most were *M. lucifugus*.

Our count was similar to those of Wilson and Bowles for 1971-73, and we believe the winter bat population in Searryl's Cave has been fairly stable. Their unpublished banding results and population estimates for 1971 and 1972, respectively, were: *M. lucifugus* — 50, 85; *M. keenii* — 2, 2; *P. subflavus* — 8, 30; *E. fuscus* — 230, 185; and estimated totals — 375, 450. In 1973, no species counts were made but their estimated total was 350.

Simpson Furnace (Dubuque Co.)

This is a mined cave with a horizontal entrance facing a small stream. There were no air currents along the dry main "walking-sized" passage and smaller side passages. Rarely visited now, the cave was sealed shut after thieves were caught storing stolen goods there. With the owner's permission, Pruszko reopened the entrance in the summer of 1983.

Twenty *E. fuscus* were found here by Muir and Polder (1960) before it was sealed. Shortly after reopening, Pruszko found 3 *P. subflavus*. In our survey, we located 8 of this species, but no *E. fuscus*.

COMMENTS

Caves, mines, and other cavernous structures are essential for winter hibernation of many bats. While fewer are available in Iowa than in Missouri and Illinois, many for which we have winter data are used by 1 or more of the 5 species known to hibernate in the State.

Based on numbers and species diversity, we regard Dance Hall, Hatfield, Maus Park #4, Searryl's, and Yew Ridge Caves, plus the wine cellar north of Fort Madison (Bowles 1975) as the most important bat hibernacula for which we have data. Unfortunately, only Dance Hall and Yew Ridge Caves are on State property and are assured of at least some protection.

Most, if not all, of the above and many others, are used as summer roosts, or by migrating bats. We found substantial amounts of guano in Finley's Landing cave and Maus number's 2 and 5, even though they are not important hibernacula. We hope future studies can focus on the importance of these structures for migrating bats.

Since bats are important components of Iowa's fauna, efforts should be made to protect critical roosts for all seasons and to systematically monitor overwintering cave bat populations.

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