



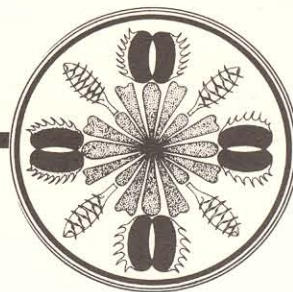
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**FOURTH COLLOQUIUM
ON CONSERVATION
OF MAMMALS
IN THE SOUTHEASTERN
UNITED STATES**

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DISTRIBUTION AND ABUNDANCE OF BATS IN CAVES AND MINES OF NORTHEASTERN MISSISSIPPI

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Little is known about Mississippi's bat fauna, which includes 14 species. The primary objective of this research was to survey caves and mines in northeastern Mississippi that could be inhabited by bats. Ten caves and one mine were located in Tishomingo (six caves and one mine) and Union (four caves) counties. Other than in Chalk Mine, Tishomingo Co., where bats were observed during every visit, and in Roberts Cave, Union Co., where one or two *Pipistrellus subflavus* were present only during winter months, no bats were observed in the caves. Chalk Mine serves as a day and night roost for *P. subflavus* throughout the year, and as a maternity site and hibernaculum. The greatest number of *P. subflavus* (12) were present in Chalk Mine during winter. *Eptesicus fuscus* and *Lasiurus borealis* were the only other species observed during the study.

MATERIALS AND METHODS

Mississippi's bat fauna includes 14 species (E. R. Hall, 1981; Kennedy et al., 1974): little brown myotis (*Myotis lucifugus*); Indiana myotis (*Myotis sodalis*); south-eastern myotis (*Myotis austroriparius*); gray myotis (*Myotis grisescens*); northern long-eared myotis (*Myotis septentrionalis*); eastern pipistrelle (*Pipistrellus subflavus*); big brown bat (*Eptesicus fuscus*); yellow bat (*Lasiurus intermedius*); red bat (*Lasiurus borealis*); Seminole bat (*Lasiurus seminolus*); hoary bat (*Lasiurus cinereus*); evening bat (*Nycticeius humeralis*); Rafinesque's big-eared bat (*Corynorhinus rafinesquii*); Brazilian free-tailed bat (*Tadarida brasiliensis*). Within Mississippi, the United States Fish and Wildlife Service lists two species of bats as endangered; *M. grisescens* and *M. sodalis*. Little is known about the biology of Mississippi's bat fauna (e.g., Crain and Cliburn, 1965; Kennedy et al., 1974; La Val, 1967). Most of the information regarding bats in the state has been gleaned from studies conducted in other states (e.g., Barbour and Davis, 1969; Crain and Packard, 1966; J. S. Hall, 1962; Humphrey, 1975; Humphrey et al., 1977; Jones, 1977; Jones and Suttikus, 1975; La Val, 1973; La Val and La Val, 1980; Lowery, 1974; Rice, 1955, 1957; Tuttle, 1976, 1979; Webster et al., 1980).

Caves and mines in northern Mississippi could harbor populations of many species of bats, including *M. grisescens* and *M. sodalis*. Objectives of this study were to survey caves and mines in northeastern Mississippi that may be occupied by bats, to determine abundance of these bats, and to provide management recommendations.

We examined published maps (United States Geological Survey) and accounts in the literature (Cliburn and Middleton, 1983; Kennedy et al., 1974; Knight, 1972; Knight et al., 1974; La Val, 1967; Middleton, 1976; Woods and Wake, 1968), and interviewed conservation officers, other law-enforcement personnel, local residents, and landowners to determine locations of caves and mines in Alcorn, Benton, DeSoto, Lafayette, Lee, Marshall, Panola, Prentiss, Tate, Tawamba, Tippah, Tishomingo, Tunica, and Union counties, Mississippi. Mist nets were placed inside, across the entrance, or outside caves and mines, and over streams, ponds, and at the edge of Pickwick Lake to capture bats for identification. In caves where the bat fauna could accurately be determined without capturing bats, no mist nets were used. During surveys of Chalk Mine (6.4 km E Iuka, Tishomingo Co.) and caves, visual inspection of potential roosting places was made and a bat detector was used to locate bats when possible. An effort was made not to disturb hibernating bats of any species. Mingo Cave 1 (Tishomingo Co.), Mingo Cave 2 (Tishomingo Co.), Chalk Mine, and Roberts Cave (Union Co.) were examined at irregular intervals from March 1990 through March 1991 to determine if there was differential use of the sites by bats during the year.

RESULTS AND DISCUSSION

Ten caves and one mine were located in Tishomingo (six caves and one mine) and Union (four caves) counties

Table 1.—*Caves and mines in northeastern Mississippi.*

Name of cave/mine	County	Approximate location and comments
Chalk Mine	Tishomingo	Ca. 6.4 km E Iuka; also known as “abandoned silica mine” and Tripoli Cave; much evidence of disturbance by humans.
Mingo Cave No. 1	Tishomingo	At mile 308.4 on Natchez Trace Parkway; also known as Cave Spring; much visitation by humans.
Mingo Cave No. 2	Tishomingo	On Poole Farm south of Iuka; also known as Charles Poole Cave (Local residents indicated this is the only cave in the area, but Cliburn and Middleton, 1983, list specimens of <i>Plethodon glutinosus</i> from Mingo Cave No. 1, Mingo Cave No. 2, Charles Poole Cave, and Nunley Cave, indicating Mingo Cave No. 2 and Charles Poole Cave are not the same cave).
Charles Poole Cave	Tishomingo	Probably same as Mingo Cave No. 2 (see comments for Mingo Cave No. 2).
Nunley Cave	Tishomingo	A water-filled sinkhole southwest of Lucy’s Cafe near Tishomingo.
Rock Creek Cave	Tishomingo	8 km SW Belmont; ca. 9 m deep and 1 m in diameter; wet walls.
Grubbs Wet Cave	Union	11.2 km SE New Albany; ca. 45 m long, 1-1.3 m in diameter; water-covered floor.
Grubbs Dry Cave	Union	11.2 km SE New Albany; ca. 24 m long, 3-5 m wide, and 1 m high; very dusty.
Roberts Cave	Union	6.4 km SE New Albany; ca. 24 m long, 1.3-1.7 m high; water in cave; open at both ends.
Land of Caves No. 1	Union	Not known by local persons (may refer to one of the entrances to Roberts Cave)
Land of Caves No. 2	Union	Not known by local persons (may refer to one of the entrances to Roberts Cave).

(Table 1). Other than in Chalk Mine, where bats were observed during every visit, and in Roberts Cave, where one or two *P. subflavus* were present only during winter months, no bats were observed in any other cave. Because of the presence of bats on a regular basis, and because previous research had documented the presence of *M. australis*, *M. grisescens*, *M. septentrionalis*, *M. sodalis*, and *P. subflavus* at the site (Kennedy et al., 1974), Chalk Mine became the primary focus of research efforts.

An early description of Chalk Mine appears in Allison’s (1907:13) paper on spring birds of Tishomingo Co., Mississippi. He states, “In a hillside rising immediately beyond a most precipitous descent, is the main opening to a ‘silica’ mine [so called by the natives] which was abandoned because of the fatality among laborers working up the material—though the miners themselves were not affected. The walls of the cave are of

an amorphous, soft, chalky material, now damp and covered in many places with slime and moss.”

Referring to the geologic formation associated with Chalk Mine, Merrill et al. (1988) recounted the geology and history of the mine. The upper portions of the Fort Payne Formation have weathered to a pulverulent, siliceous phase generally referred to as tripoli or silicastone. These deposits occur locally in a belt extending from northeastern Wayne Co., Tennessee, southward into northwestern Alabama and northeastern Mississippi. Tripoli was mined by hand, loaded onto tram cars and hauled on a tram down the valley. The main entrance has collapsed, and entry is achieved through a small air vent into the main shaft area.

We observed graffiti painted on the walls inside and at the entrance of Chalk Mine, trash inside and outside the mine, smoke from fires inside and outside the mine,

and we saw several persons entering and leaving the mine. However, during non-summer months, there appears to be little visitation by humans. Most people approach the site by boat on Pickwick Lake, then walk ca. 300 m to the entrance of the mine.

In addition to Chalk Mine, *M. austroriparius* has been reported from several counties in Mississippi (Kennedy et al., 1974; La Val, 1967, 1970; Wolfe, 1971). The last records of occurrence of this species at Chalk Mine were in the late 1930s (La Val, 1967). We did not encounter this species.

Myotis grisescens is known only from Chalk Mine in Mississippi (Kennedy et al., 1974; La Val, 1967; White, 1961; Wolfe, 1971). We did not encounter this species, but colonies of this species are present near the Tennessee River in nearby Alabama (La Val, 1967).

White (1961) was the first to document the presence of *M. septentrionalis* (= *M. keeni*) in Mississippi. Apparently, all records of this species are associated with Chalk Mine (Kennedy et al., 1974). Prior to La Val's visit to Chalk Mine on 5 August 1966, collection dates for all specimens were in the late 1930s (La Val, 1967). In 1966, R. K. La Val observed one *M. septentrionalis* and one *P. subflavus* inside Chalk Mine; the mine already was heavily disturbed by activity of humans (R. K. La Val, in litt.). A report on mammals of Shiloh National Military Park, Tennessee, verifies the recent occurrence of *M. septentrionalis* within ca. 80 km of Mississippi (M. L. Kennedy, in litt.). In addition, there is a record of this species from near Red Bay, Franklin Co., Alabama,

during 1990 (Hilton, 1993; Hilton and Best, 2000). Thus, a small population of *M. septentrionalis* persists in the vicinity of northeastern Mississippi.

The only records of *M. sodalis* for Mississippi are from the late 1930s. Five specimens were collected from Chalk Mine on 16 July 1939, and 11 were collected from the Tennessee River Area on 10 August 1937 (La Val, 1967). We did not encounter this species.

Previous accounts have listed specimens of *P. subflavus* from Chalk Mine (Davis, 1959; Kennedy et al., 1974; White, 1961), and we found this species in Chalk Mine during each of our visits (Table 2). Chalk Mine serves as a day and night roost for *P. subflavus* throughout the year. In addition, it serves as a maternity site and as a hibernaculum. Observations during winter provided the greatest number of individuals (12); some were covered with condensed water indicating they may have been in hibernation. That they were not in hibernation for long periods of time was indicated by their movement between times of observation. Individuals were hanging from the walls and ceiling at heights of 2-5 m. Based upon observations of several hundred individuals in similarly sized (or smaller) caves in Alabama during winter months (Best et al., 1993), frequent entry by humans may reduce the number of bats using Chalk Mine as a hibernaculum.

A male *E. fuscus* was captured in a mist net set inside Chalk Mine on 17 August 1990. One or two individuals were observed in the mine during December, January, and February (Table 2). Observations in

Table 2.—Numbers and species of bats occurring inside Chalk Mine, 6.4 km E Iuka, Tishomingo Co., Mississippi, 1990-1991.

Date	Numbers and species of bats observed	
	<i>Eptesicus fuscus</i>	<i>Pipistrellus subflavus</i>
10 March	0	1
9 June	0	6
27 June	0	5 (+2 young)
15 July	0	3 (+3 young)
17 August	1	5
28 October	0	10
1 December	0	12
28 December	2	12
26 January	1	12
15 February	1	8
8 March	0	6

LITERATURE CITED

winter did not indicate the animals were in hibernation, although none flew from roost sites. Big brown bats observed in winter were within the twilight area near the entrance. This species had not been reported previously from Chalk Mine.

The only other species of bat we encountered near Chalk Mine was *L. borealis*. This species frequently was captured in mist nets placed in the wooded area near Chalk Mine (it was especially common to capture this species in nets placed just upstream from the nearby arm of Pickwick Lake ca. 200 m from the mine), but none occurred in the mine. M. L. Kennedy captured one *L. borealis* in a mist net placed outside of Chalk Mine on 3 January 1977 (M. L. Kennedy, in litt.).

In the past, Chalk Mine has been an important site for bats. Although there are no indications that the mine ever served as home for large colonies, most records for the rarest species of bats in Mississippi have come from the mine. The authors have recommended that the mine be purchased by the state of Mississippi and that the entrance is fenced or gated to keep humans out of the mine. Perhaps, this mine will again become a home for rare species of bats.

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