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# SURVEY OF BATS AND SEARCH FOR ENDANGERED BAT SPECIES, PARTICULARLY THE INDIANA BAT (MYOTIS SODALIS), AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (FEMP), HAMILTON AND BUTLER COUNTIES, OHIO - DEPARTMENT OF LIFE SCIENCES INDIANA STATE UNIVERSITY

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JOHN WHITAKER
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REPORT

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# SURVEY OF BATS AND SEARCH FOR ENDANGERED BAT SPECIES, PARTICULARLY THE INDIANA BAT (*MYOTIS SODALIS*), AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (FEMP), HAMILTON AND BUTLER COUNTIES, OHIO

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# SURVEY OF BATS AND SEARCH FOR ENDANGERED BAT SPECIES, PARTICULARLY THE INDIANA BAT (MYOTIS SODALIS), AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (FEMP), HAMILTON AND BUTLER COUNTIES, OHIO

ABSTRACT: Eleven samplings for bats were made at ten sites in the summer of 1994 (site 7 was netted twice) at the Fernald Environmental Management Project (FEMP), Hamilton and Butler Counties, Ohio. The main purpose was to sample for the Indiana bat, a federally endangered species. Sampling was by mistnetting, supplemented by bat detector. Efforts were made to locate areas with trees with loose or dead bark or with hollow trees as these types of trees may serve as sites for maternity colonies. Sampling occurred along Paddys Run, and tributaries that appeared to be good habitats or flyways for bats. No endangered or threatened bats were netted; however, 29 bats of three species were taken, including 18 big brown bats, 8 red bats, and 3 little brown bats.

## INTRODUCTION

Eleven species of bats are considered to be inhabitants of Ohio (Gottschang, 1981): four species of Myotis including M. lucifugus (little brown myotis), M. sodalis (Indiana myotis) M. septentrionalis (northern myotis), and Myotis leibii (small-footed myotis), four other species of social bats including Pipistrellus subflavus (eastern pipistrelle), Eptesicus fuscus (big brown bat), Nycticeius humeralis (evening bat), and Plecotus rafinesquii (Rafinesque's big-eared bat): and three species of solitary bats, Lasionycteris noctivagans (silver-haired bat), Lasiurus cinereus (hoary bat) and L. borealis (red bat).

Two additional species, Myotis grisescens (gray myotis) and Tadarida brasiliensis (Brazilian free-tailed bat) have been taken in Ohio. However, both are considered to be of accidental occurrence rather than residents of the state.

Two of the species resident in Ohio are not likely to occur at the FEMP; Rafinesque's big-eared bat and the small-footed myotis. Each is known from only one county in Ohio; the small-footed myotis is from Erie County in north central Ohio, and the big-eared bat from Abrams County in south central Ohio. Both species are rare and are candidates for federal listing. Their current status in Ohio should be investigated. The one individual of Myotis leibii known from Ohio is the type specimen for the species. It was taken by Audubon and Bachman (1851). Two individuals of the big-eared bat were taken in two separate caves in Green Township, Abrams County, one in March 1953, and the other in December 1960 (Gottschang, 1981).

Thus, nine of the 11 species of bats recognized as residents of Ohio are candidates for occurrence at the FEMP, and all nine have been previously taken in the general area of Hamilton and

Butler counties, the counties in which FEMP is located. The little brown myotis has been taken in Hamilton and Butler counties, the big brown bat, red bat, hoary bat, evening bat and pipistrelle in Hamilton County, and the silver- haired bat, northern myotis, and Indiana myotis in Clermont County, the next county to the east of Hamilton County.

The least likely of the nine species to occur at the FEMP is the evening bat. The evening bat has apparently declined in the northern part of its range. For example, eleven colonies of this species were known from Indiana 30 years ago and were distributed roughly along the major southern rivers in Indiana, the Ohio and the Wabash. All of the original 11 colonies are now gone. There is only one known colony in Indiana (Whitaker and Gammon, 1988), and as of this writing, it could be gone. Although the evening bat is currently unlisted in Ohio, it could be scarce or even extirpated in this state; however, no recent data are available. It should probably be state listed. The silver-haired bat is a spring and fall migrant and undoubtedly passes through the FEMP, probably in some numbers at that time. However, it should not be present at the base or even in Ohio at all in the summer. However, one individual was taken on 24 June 1988, in a bat survey by Advanced Sciences, Inc. (ASI) in the summer of 1988 (see description below), and one was taken by us on June 3, 1994, at Wright-Patterson Air Force Base in Greene County, Ohio. Most silver-haired bats pass through Indiana and Ohio in the spring from mid-April through May, and again in the fall from late August through early November.

A survey of bats was carried out in the summer of 1988 in the vicinity of the FEMP by ASI (DOE 1993 FINAL, March, 1993), with 13 sampling sites along the Great Miami River and Paddys Run. A total of 63 bats of five species was taken: eight Indiana myotis, one little brown myotis, 32 big brown bats, 21 red bats and one silver-haired bat. All individuals of the Indiana myotis were taken to the northeast of the FEMP along Banklick Creek, a tributary of the Great Miami River. The presence of this number of Indiana myotis, especially the five females, indicates the presence of a maternity colony in the immediate vicinity of the sampling site. Three of the 13 sites were actually on the FEMP, all on Paddys Run, (ASI sites I, IV and VII). Site I was near the northern border of Hamilton County, and was netted on 24 June, 1988 (one silver-haired and two red bats were taken). At Site IV (just north of Willey Road netted on 30 June, 1988), 2 red bats were taken. Site VII was located in Butler County, north of the railroad tracks. It was netted on 9 August 1988 and yielded 12 big brown bats and six red bats. Thus three species have previously been taken at the FEMP, red, big brown and silver-haired bats.

## THE SPECIES

Information is summarized below on the various species known or likely to occur at the FEMP, mostly from Gottschang (1981), and Mumford and Whitaker (1982).

SPECIES OF PARTICULAR INTEREST.

Myotis sodalis Indiana bat.

STATUS: FEDERALLY ENDANGERED

The Indiana bat forms maternity colonies under the loose bark of trees. It hibernates in large numbers in a very few caves. Barbour and Davis (1969) found bats of this species at a number of Ohio localities. The bats had been previously banded by Barbour and Davis in two Kentucky cave hibernacula. This indicated that Indiana bats were moving to the north and east from their winter quarters. Evidence of a maternity colony of Indiana bats was found at Banklick Creek in 1988, only about two miles northeast of the FEMP. This species could easily occur at the FEMP.

OTHER SPECIES

Myotis lucifugus. The little brown myotis could be present at the FEMP. Only one individual was taken in the 1988 survey, but not on the FEMP itself. This species forms maternity colonies usually in buildings and it migrates to caves to hibernate.

Myotis septentrionalis. The northern myotis is often referred to as Keen's myotis, Myotis keenii. However, Keen's myotis is currently recognized as a separate species which occurs only in the west. The northern myotis could occur at the FEMP. It usually forms relatively small maternity colonies under the loose bark of trees in summer or sometimes in buildings. In winter, it is solitary, with most individuals hibernating in tiny cracks or other hidden places in caves or mines.

Nycticeius humeralis. The evening bat is not not listed, but should be considered for state endangered status. It forms maternity colonies in buildings. It is not known where this species hibernates, but we suspect it may be in hollow trees along larger streams to the south. It could be present at the FEMP; however, we suspect it may have declined in Ohio. Its status in Ohio needs to be investigated.

Pipistrellus subflavus. The pipistrelle is the smallest bat in Ohio and could easily occur at the FEMP. It forms small maternity colonies in buildings or in hollow trees. In winter it is a solitary hibernator in caves and mines.

Eptesicus fuscus. In summer, the big brown bat forms maternity colonies usually in buildings or other human-made structures. A few big brown bats hibernate in caves and mines, but most individuals hibernate in buildings. There are usually not more than 1 to 10 in any one building, although a few buildings that have been available for a long time have larger numbers (Whitaker and Gummer, 1993). This is one of the most common bats in Ohio and is the only species that hibernates in buildings in Ohio. A total of 32 individuals of this species was taken during the 1988 study, 12 of them at the FEMP.

Lasiurus borealis. The red bat is solitary, but is one of the most common bats in Ohio. It hangs among foliage in summer and migrates south where it probably hibernates in trees in winter. The northern edge of the hibernating range is probably just north of the FEMP. A total of 21 individuals of this species was taken in the 1988 survey, ten of them at FEMP.

Lasiurus cinereus. The hoary bat is the largest bat of Ohio and is one of the most colorful. Like the red bat, it hangs in foliage in the daytime in summer, but it migrates far south for the winter. It is probably present at the FEMP, but is quite uncommon; therefore it is not likely not to be taken in a limited survey.

Lasionycteris noctivagans. The silver-haired bat is a distinctively colored migratory species. It migrates through FEMP in spring and fall but should not be present in summer, although one individual was taken at the FEMP on June 24 in the 1988 survey. It is difficult to explain the presence of this bat at the FEMP at that time, but presumably it was a very late migrant. This species has its young in trees to the north of Ohio, then moves south to hibernate. Little is known of specific sites, but a very few individuals hibernate in caves and mines and some may hibernate in trees.

## OBJECTIVES OF PROJECT

The principal objectives of this project were:

1. To locate populations of the federally endangered Indiana myotis, Myotis sodalis.

2. To accumulate further information on the bat community present at the FEMP.

3. To make management recommendations for the FEMP concerning bats.

## MATERIALS AND METHODS

The FEMP was visited on April 13, 1994 to determine where mistnetting would take place. Much good habitat was found along

Paddys Run and its tributaries. Mistnetting was recommended for ten sites and site numbers were assigned at that time. Two of the recommended sites were in the Storm Sewer Outfall Ditch entering Paddys Run from the northeast. The other eight sites were in the main stream: four in the northern half, two above and two below the railroad bridge, and four in the southern half of the FEMP property. The sites were primarily in or near areas with large dead standing trees, especially those with loose bark or which were hollow. Actual mistnetting sites were selected in areas that appeared suitable as bat flyways, as well as areas over which canopy occurs, since mistnets do not work well unless they extend upward to a canopy. If no canopy is present the bats generally sense and fly over the net. Mist netting for Indiana bats should occur between May 15 and August 15, since some of the bats begin to disperse and head for the hibernaculae in late August.

Mistnetting was carried out between June 6 and July 11, 1994 on Fernald property. Sampling at each site was carried out from dusk to midnight or later, depending on results. One, two, or three seven foot high nets were placed one above the other to reach the canopy. Three net lengths were available, 18, 30, and 42 feet, although 30 foot nets were used at all sites. The nets were on a pulley system on telescoping aluminum poles, so that nets could be raised and lowered to remove bats.

Data recorded at each site included type of habitat, water depth and permanence, type bottom, species and size of trees, and whether there were hollow trees or trees with loose bark in the vicinity.

In addition to the mistnets, bat detectors were used during all sampling to detect echolocation calls in the vicinity of the net. This allows one to determine bat activity during the netting. The number of calls heard on the detector during each sampling was recorded, which gave an assessment of how well the nets were doing in relation to bat activity. Numerous calls on the detector, but no bats in the net would indicate that the nets should be repositioned. Some species of bats can be identified at least part of the time by their high frequency calls, particularly red, evening and big brown bats, so some species-specific data can be accumulated using the bat detector. Detection for bats often occurred above and below the site to determine relative bat activity. Also, the bat detectors can be used to sample areas of marginal habitat or areas with little canopy for bat activity to see if netting should be attempted there.

## RESULTS

No endangered or threatened bats were recorded at the FEMP during the present study.

Twenty-nine bats were netted, but only three species were represented: 18 big brown bats, Eptesicus fuscus, 8 red bats, Lasiurus borealis, and 3 little brown myotis, Myotis lucifugus

(Table 1). These numbers were somewhat lower than expected, especially since the general terrestrial habitat for bats appeared to be quite good. Ten sites were sampled for a total of 11 times along Paddys Run and its tributaries (Figure 1). Eight of the sites including the one sampled twice (site 7) were on Paddy's Run and two were on the Storm Sewer Outfall Ditch. Data for each net site are given in Appendix 1.

## DISCUSSION

The most probable reason bat numbers and diversity are low at the FEMP is that most of Paddys Run becomes completely dry early in the summer and remains that way throughout most of the time during the year when bats are active. It contains water only after major storms. It is a fairly large stream (averaging about 25 feet in width) and if not dry, it should be an excellent foraging habitat for bats.

Evidence that this assessment is correct was obtained during this study and also during the 1988 assessment by ASI; in both studies the larger numbers of bats were taken from the upper portion of Paddys Run, the only portion that contains water all year. During this study, 23 bats were taken in three samples at four locations upstream (sites 6, 7 and 8 (mean = 5.75), and six were taken at seven locations downstream (mean = 0.86). In the ASI sampling, 18 bats were taken at the one upstream site, and five bats were taken at the two downstream sites (mean = 2.5).

Thus, these data appear to indicate that there are relatively few bats present at the FEMP suggesting that it is because much of the stream is dry most of the year.

The 1988 ASI sampling effort resulted in more bats per sample (23 in three samples, mean= 7.6), than were taken in the present study (29 bats in 11 samples, mean = 2.6). Part of this difference was because ASI obtained one sample in August after the young of the year had entered the population (the ASI sample contained 9 immature individuals), whereas the entire 1994 sample was taken before the young were volant. ASI netted three species including 12 big brown bats, 6 red bats and one silver-haired bat. We also netted three species, including 18 big brown bats, 8 red bats and 3 little brown myotis. Thus, four species of bats have been taken to date at the FEMP.

Additional sampling may eventually turn up at least occasional specimens of four other species at the FEMP, the northern myotis, the Indiana myotis, the hoary bat, and the pipistrelle.

## MANAGEMENT RECOMMENDATIONS

1. INDIANA BATS. Indiana bats were taken by ASI about two miles from the FEMP in 1988, but none were taken by ASI or during the present study at the FEMP. However, this species most often uses

larger trees with loose bark in riparian areas for maternity roosts. Plenty of this type of woodland exists at the FEMP along Paddys Run and in the Storm Sewer Outfall Ditch. There appears to be no reason why this bat could not take up residence there in the future, especially as the trees continue to age. The best habitat is that above the railroad bridge where water remains all year. That area should certainly be saved, but care should be taken to retain as much of the riparian woods as possible.

Bat box installations have been suggested as a potential mitigative measure favorable to Indiana bats. My recommendation is that the trees, especially the larger trees be retained in so far as possible. If the trees can be saved, I would recommend that bat boxes not be used because a) plenty of potential roost trees already exist at the FEMP, b) Indiana bats usually roost under loose bark of trees, thus are very unlikely to use bat boxes, and c) bat boxes would detract from the natural nature of the habitat.

If it is essential that existing larger trees are to be removed over extensive areas, then the FEMP might consider some experimental mitigative measures to improve habitat for Indiana bats in those areas. However, I would not use bat houses as currently understood. Rather, I would suggest simulating the loose bark under which maternity colonies are normally found. Shingles or perhaps even tree bark could be used to produce simulated "loose bark" on smaller trees or even on poles in the areas from which larger trees have been removed. The upper parts of the "loose bark" should be enclosed in such a way that water does not leak into the simulated roost. Since bats regulate their body temperatures by moving about within the roost, the simulated roosts should be built to surround the tree or pole to maximum temperature variation within the roost. The simulated roosts should be in a position where they get quite a bit of sun during the day.

2. OTHER SPECIES OF BATS. Bats are the major predators on night flying insects. They help control many pest species of insects and in addition help to maintain the "balance of nature," i.e. current food web interactions. The big brown bat feeds heavily on cucumber beetles, and larval cucumber beetles are the corn rootworms, one of the most important agricultural pests in this country. Most species of bats in Ohio other than the big brown bat are probably declining because of loss of habitat and perhaps use of pesticides. Therefore, other species of bats may well become threatened or endangered in the future. Because bats are such important predators of insects (especially the big brown bat), and because their populations are declining, the FEMP should attempt to protect all bats, not just those that are currently listed as endangered or threatened.

3. RIPARIAN HABITAT. Wetlands and riparian habitat have been greatly reduced over the past century. Excellent riparian habitat exists along the length of Paddys Run on the FEMP property. This

entire area should be left basically undisturbed as much as possible. It provides good habitat for many species of terrestrial plants and animals besides bats. This is especially true for the FEMP property north of the railroad on Paddys Run, which provides excellent habitat for many aquatic and terrestrial animals as well as for bats.

4. WOODLANDS AND OTHER NATURAL HABITATS. The great majority of natural habitat in the Cincinnati area and in Ohio has been developed or cleared as agricultural land over the past century. Therefore, every opportunity should be taken to save as much remaining natural habitat as possible. The FEMP has a good deal of natural habitat, and it is recommended that as much of it as possible be retained in its natural state. This will help to protect endangered and threatened species currently present or that might be present in the future, and would also help save other species from becoming endangered or threatened.

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Table 1. Summary of information on bats netted at ten sites (11 samples) at the Fernald Environmental Management Project (FEMP), Hamilton and Butler counties, Ohio, June 6 to July 11 1994.

| Site | *E. fuscus* | *L. borealis* | *M. lucifugus* | TOTAL |
|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 0 |
| 3 | 2 | 0 | 0 | 2 |
| 4 | 1 | 0 | 0 | 1 |
| 5 | 0 | 2 | 0 | 2 |
| 6 | 0 | 1 | 1 | 2 |
| 7a | 6 | 1 | 0 | 7 |
| 7b | 8 | 3 | 1 | 12 |
| 8 | 1 | 0 | 1 | 2 |
| 9 | 0 | 0 | 0 | 0 |
| 10 | 0 | 1 | 0 | 1 |
| | 18 | 8 | 3 | 29 |

Table 2. Summary of data on bats netted at 10 sites (11 samples) during the present study (1994) and from 3 sites netted by ASI (1988) at the FEMP.

| | Sites with species No. | % | Bats No. | No./ sample |
|---|---|---|---|---|
| BATS NETTED IN 1994 IN 11 SAMPLES | | | | |
| E. fuscus. Big brown bat. | 5 | 45.4 | 18 | 1.6 |
| L. borealis. Red bat. | 5 | 45.4 | 8 | 0.7 |
| M. lucifugus. Little brown myotis. | 3 | 27.3 | 3 | 0.3 |
| BATS NETTED IN 1988 IN 3 SAMPLES | | | | |
| E. fuscus. Big brown bat. | 1 | 33.3 | 12 | 4.0 |
| L. borealis. Red bat. | 3 | 100 | 10 | 3.3 |
| L. noctivagans | 1 | 33.3 | 1 | 0.3 |

//

**APPENDIX 1. Collection sites at Fernald Environmental Management Project (FEMP), Hamilton and Butler Counties, Ohio, June 6 to July 12, 1994**

The entire length of Paddys Run and the Storm Sewer Outfall Ditch appear to be suitable habitat for the Indiana bat. There are plenty of large trees present, with a number of species, including cottonwood, sycamore, oaks and maples, some of which have loose bark. However, much of Paddys Run dries up early in the summer, probably greatly reducing insect populations which would otherwise be present. Information on individual sites is given below.

Site #1. Upper Storm Sewer Outfall Ditch. Shandon Quadrangle. R1 T1. Section 6. 6994 x 43513; 30 x 14 ft. mistnet. 7 June 1994. Temp: 58-56 degrees. 8:30PM to midnight. Stream 20 feet wide, but dry at sampling. Riparian area heavily wooded including large trees.

No bats captured.
No bats detected in about 1 hour.

Site #2. Lower Storm Sewer Outfall Ditch. Shandon Quadrangle. R1 T1. Section 7. 6993 x 43511. 30 x 14 ft. mistnet. 7 June 1994. Temp: 58-56 degrees. 8:30PM to midnight. Stream 12 feet wide, but dry at sampling. Riparian area heavily wooded including large trees.

No bats captured.
only two bats detected, *E. fuscus*.

Site #3. Paddys Run. about 100 yards upstream from Willey Road and cement bridge. Shandon Quadrangle. R1 T1. Section 7. 6990 x 43509. 30 x 14 ft. mistnet. 12 July, 1994. Temp: 58-56 degrees. 8:30 to 12:30PM. Stream 30 feet wide, but dry at sampling. Shore heavily wooded including mixed species of large trees, including sycamore, cottonwood and hackberry.

| | | |
|---|---|---|
| *Eptesicus fuscus* | male | 10:20 |
| *Eptesicus fuscus* | male | 10:20 |

only 3 bats detected in about one hour.

Site #4. Paddys Run by Inactive Fly Ash Pile. Shandon Quadrangle. R1 T1. Section 6. 6988 x 43514. 30 x 14 ft. mistnet. 6 June, 1994. Temp: 75 degrees. 8:30PM to 12:15. Stream 25 feet wide, but dry at sampling. Shore heavily wooded including large trees.

| | | |
|---|---|---|
| Eptesicus fuscus | female | 10:25 |

8 calls heard, all Eptesicus.

Site #5. Paddys Run north of K-65 silos. Shandon Quadrangle. R1 T1. Section 6. 6987 x 43516. 30 x 21 ft. mistnet. 11 July, 1994. Temp: 75-65 degrees. 8:30PM to 12:30. Stream 25 feet wide, but dry at sampling. Shore heavily wooded including large trees. Flood lights at the K-65 Silos somewhat hampered netting here.

| | | |
|---|---|---|
| Lasiurus borealis | male | 10:25 |
| Lasiurus borealis | female | 11:00 |

9 calls heard on detector, 2 Eptesicus, 1 probably Myotis, rest probably red bat.

Site #6. Paddys Run at railroad trestle. Shandon Quadrangle. R1 T1. Section 6. 6984 x 43527. 30 x 14 ft. mistnet. 8 June, 1994. Temp: 68 degrees. 8:30PM to 12:30. Stream 25 ft. wide, to 6 feet deep. Shore semi-wooded including large trees.

| | | |
|---|---|---|
| Myotis lucifugus | female | 10:40PM |
| Lasiurus borealis | male | 11:10PM |

29 calls heard on detector.

Site #7. Paddys Run above trestle at north boundary of FEMP property. Shandon Quadrangle. T 3N R 2E. Section 31. 6984 x 43532. Stream above trestle retains water most of time. Shore with open woods including large trees, ash, sycamore, honey locust and others.

Sample 1. 30 x 20 ft. mistnet. 9 June 1994. Temp: 75-65 degrees. 8:30PM to 12:45. Stream 25 feet wide, 8 inches deep.

| | | |
|---|---|---|
| Eptesicus fuscus | female | 10:10 |
| Eptesicus fuscus | female | 11:40 |
| Eptesicus fuscus | escaped | 11:46 |
| Eptesicus fuscus | female, pregnant | 12:00 |
| Lasiurus borealis | female | 12:20 |
| Eptesicus fuscus | escaped | 11:30 |
| Eptesicus fuscus | male | 11:40 |

27 calls heard on detector.

Sample 2. 42 x 24 ft. mistnet. 14 July 1994. Temp: 80 degrees. 9:00PM to 1:00AM. Stream 25 feet wide, 8 inches deep.

| | | |
|---|---|---|
| Myotis lucifugus | female | 10:20 |
| Eptesicus fuscus | female, lact. | 10:30 |
| Eptesicus fuscus | female pregn. | 10;38 |
| Lasiurus borealis | male, | 10:50 |
| Lasiurus borealis | male, | 11:00 |
| Eptesicus fuscus | female, lact. | 11:20 |
| Lasiurus borealis | male | 11:45 |
| Eptesicus fuscus | male | 12:00 |
| Eptesicus fuscus | female pregn. | 12:15 |
| Eptesicus fuscus | female, lact | 12:25 |
| Eptesicus fuscus | female, pregn. | 12:30 |
| Eptesicus fuscus | female, pregn.* | 12:40 |

*only one embryo.
23 calls, mostly big brown bat.

Twelve big brown bats and 6 red bats were taken at this site on 9 August 1988 by ASI (ASI #VII).

Site #8. Paddys Run above railroad trestle and below site 7. Shandon Quadrangle. T 3N R2E. Section 31 6984 x 43530. 30 x 14 ft. mistnet. 9 June 1994. Temp: 75-65 degrees. 8:30PM to 12:15. Stream 25 feet wide, 1 foot deep. Stream above trestle retains water most of time. Bank with open woods including large trees such as ash, sycamore, black locust and others.

| | | |
|---|---|---|
| Eptesicus fuscus | male | 11:40 |
| Myotis lucifugus | female, lactating | 10:40PM |

8 calls on detector in 1 hour.

Site #9. Paddy's Run 100 yds below trestle. Shandon Quadrangle. R1 T1. Section 6. 6985 x 43525. 30 x 14 ft. mistnet. 8 June 1994. Temp: 68 degrees. 8:30PM to 12:00. Stream 20 feet wide, 1 foot deep. Stream above trestle retains water most of time. Shore with open woods including large trees, ash, sycamore, honey locust and others.

No bats taken
None heard on detector from dusk to 10PM.

Kingfisher captured in net.

Two red bats and one silver-haired bat were netted at or near this site in 1988 by ASI (ASI site #1).

Site #10. Paddy's Run at old cement bridge at lower end of FEMP. Shandon Quadrangle. R1 T1. Section 7. 6989 x 43507. 30 x 14 ft. mistnet. 12 July 1994. Temp: 68 degrees. 8:30PM to 12:00. Stream 20 feet wide, but dry at sampling. Shore with open woods including large trees, ash, sycamore, honey locust and others.

Lasiurus borealis male 10:25

Two red bats were netted at or near this site on 30 June, 1988 by ASI (ASI site #IV).

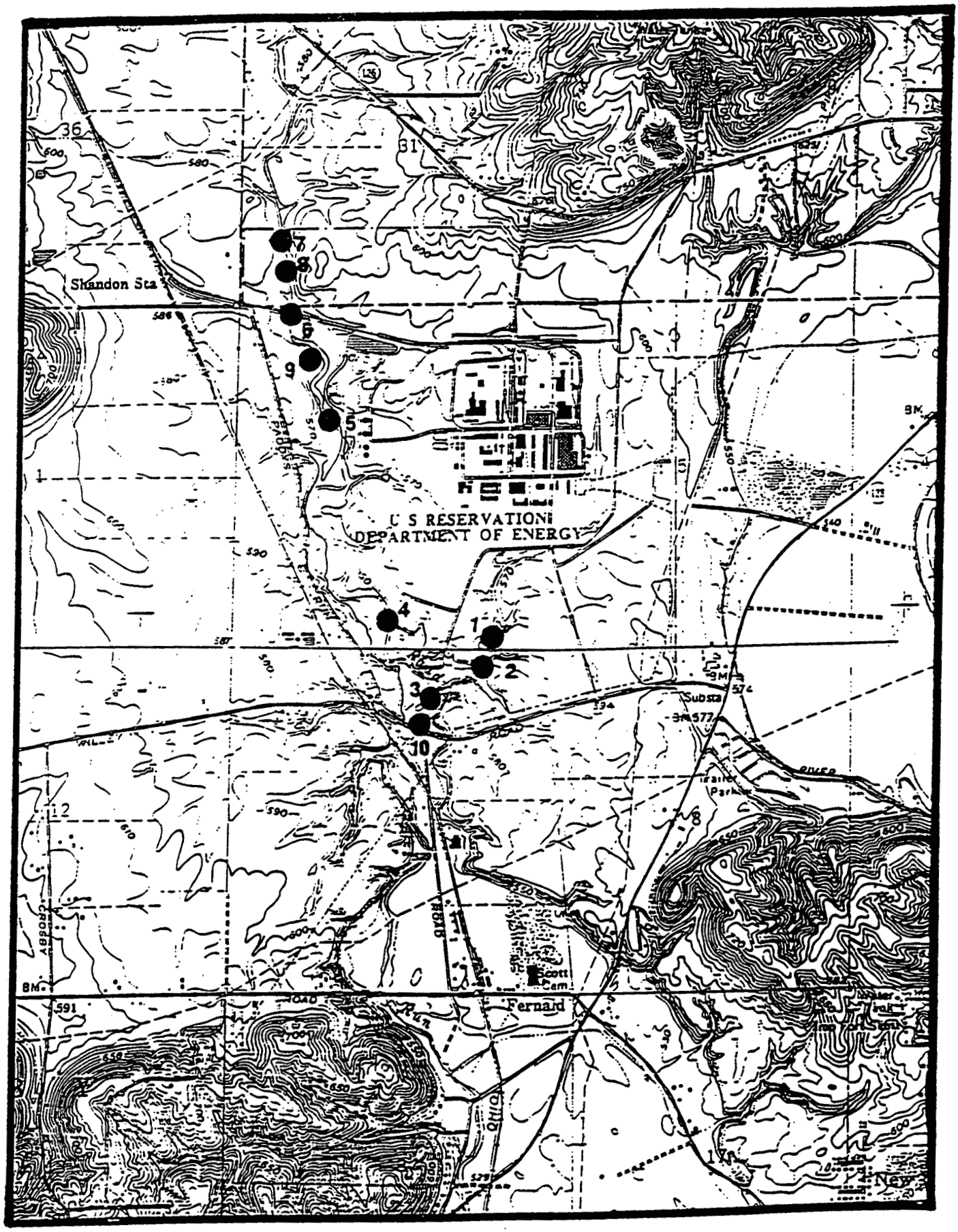


Figure 1. Sites netted for bats in 1994 at the Fernald Environmental Management Project (FEMP), Hamilton and Butler Counties, Ohio.