APPENDIX J

PRELIMINARY SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT *(Myotis sodalis)* AND VIRGINIA BIG-EARED BAT *(Corynorhinus townsendii virginianus)*

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PRELIMINARY SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (*MYOTIS SODALIS)* AND VIRGINIA BIG-EARED BAT (*CORYNORHINUS TOWNSENDII VIRGINIANUS*) AT THE PROPOSED STURGEON CREEK AND WAR FORK RESERVOIR SITES IN JACKSON COUNTY, KENTUCKY

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October 1999

I. INTRODUCTION

Eco-Tech, Incorporated has been contracted by Mangi Environmental Group Incorporated, to provide surveys for federally endangered Indiana (*Myotis sodalis*) and Virginia big-eared bat (*Corynorhinus townsendii virginianus*) at the proposed Sturgeon Creek and War Fork reservoir sites, Jackson County, Kentucky (see attached project location maps).

II. DISTRIBUTION

Indiana bat

The Indiana bat's range includes most of the eastern United States. It occurs from Oklahoma, Iowa, and Wisconsin east to Vermont, and south to northwestern Florida (Barbour and Davis 1969). The majority (85%) of the range-wide population hibernates in ten Priority 1 hibernacula (sites that contain more than 30,000 individuals), which are located in Indiana (three sites), Kentucky (four sites), and Missouri (three sites). Some Indiana bats migrate long distances from their hibernacula to find suitable summer habitat to raise offspring. Until recently it was thought that the entire species, with the exception of some males, migrated north and west from their hibernacula to forested areas in Missouri, Indiana, Kentucky, Iowa, Ohio, and Michigan during the summer (Barbour and Davis 1969). This migration pattern is illustrated by Barbour and Davis (1969), with summer band recoveries of both male and female bats banded at Carter Caves, Carter County, Kentucky, from near the Wayne National Forest in southern Ohio. Currently, reproductive Indiana bats have been documented from the following states: Illinois, Indiana, Iowa, Kentucky, Michigan, Missouri, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. While reproductive Indiana bats have not been documented in Jackson County, there are many winter records and it is likely that some bats remain in close proximity to the caves during the summer.

Virginia big-eared bat

The Virginia big-eared bat (*Corynorhinus townsendii virginianus*), reclassified from the genus *Plecotus* (Tumlison and Douglas 1992), is an endangered subspecies of Townsend's big-eared bat (*C. townsendii*). Virginia big-eared bats occur as isolated populations in eastern Kentucky, eastern West Virginia, southwestern Virginia and northwestern North Carolina (Barbour and Davis 1969, Slone and Wethington 1998). In Kentucky they have been documented from nine counties (Estill, Jackson, Lee, Menifee, Morgan, Powell, Rockcastle, Rowan, Wolfe). Virginia big-eared bats prefer caves in karst regions (i.e., areas underlain with limestone bedrock and many caves and sinkholes) dominated by oak-hickory forest. Virginia big-eared bats are nonmigratory bats and seldom move far from their home roosting site. However, Virginia big-eared bats do readily move from one roost to another within their home range. The longest movement recorded for Virginia big-eared bats in Kentucky and West Virginia averaged about 40 miles (Barbour and Davis 1969).

III. NATURAL HISTORY

Indiana Bat

Winter Habitat

During the short days of autumn, Indiana bats roost under sloughing bark and in cracks of dead, partially dead, and live trees (Kiser and Elliott 1996, J. MacGregor *et al.*, unpublished data). Roost trees used by Indiana bats during the autumn range from 4.7 to 26.4 inches in dbh (diameter at breast height) and occur in forested, semi-forested and open habitats within 1.4 miles of the hibernacula (Kiser and Elliott 1996). Depending on local weather conditions, Indiana bats normally enter the hibernaculum in October and remain there through April (Hall 1962, LaVal and Laval 1980). Most of the hibernacula with large colonies are located in Missouri, Indiana, Kentucky, Tennessee, and Arkansas (Brady *et al.* 1983).

According to Barbour and Davis (1969), temperature and relative humidity are important factors in the selection of hibernation sites. During the early fall Indiana bats roost in warm sections of caves and move down a temperature gradient as temperatures decrease. In mid-winter Indiana bats tend to roost in portions of the cave where temperatures are cool (37° to 43° F). Relative humidity in Indiana bat hibernacula tends to be high ranging from 66% to 95% (Barbour and Davis 1969). Prior to entering the hibernacula swarming occurs at the entrances (Cope and Humphrey 1977), or sometimes at other caves located near the hibernacula (LaVal *et al.* 1977, J. MacGregor, unpublished data). Swarming usually lasts for several weeks (August - September) and mating occurs toward the end of this period. Mating females usually enter directly into hibernation, whereas males may remain active through the end of November. Adult females store sperm through the winter thus delaying fertilization until early May. During April and May the majority of the Indiana bat population will leave the cave areas and find suitable summer habitat. Females usually start grouping into larger nursery colonies by mid-May and give birth to a single young between late June and early July (Easterla and Watkins 1969, Humphrey *et al.* 1977).

Summer Habitat

Maternity colonies have been found under sloughing bark of dead and partially dead trees in upland and lowland forest (Cope *et al.* 1974, Humphrey *et al.* 1977, Gardner *et al.* 1991). These colonies are usually located in large-diameter, standing dead trees with direct exposure to sunlight (Callahan *et al.* 1997). A maternity roost may contain more than 100 adult females. During Callahan *et al.*'s (1997) study, he arranged roost trees into two groups depending on the intensity of use and size of
the colony that used each tree. Callahan (1993) classified any tree that was used more than once by greater than 30 bats each time as a primary roost tree, and any tree with less than 30 bats or used only once as an alternate roost tree. The primary roost trees had an average dbh of 22.4 inches, while open snags used as alternate roosts had an average dbh of 20.9 inches (Callahan *et al.* 1997). For unknown reasons, Indiana bats require many roost trees to fulfill their needs

during the summer (Callahan *et al.* 1997). In Michigan, Kurta and Williams (1992) found that Indiana bats used two to four different roost trees during the course of one season. Although Indiana bats have been found roosting in several different species of trees, it appears that Indiana bats choose roost trees based on their structural composition. Therefore, it is difficult to determine if one particular species of tree is more important than others. However, twelve tree species have been listed in the Habitat Suitability Index Model (3D/International, Incorporated 1995) as primary species (class 1 trees). The trees listed by 3D/International, Incorporated (1995) include silver maple (*Acer saccharinum*), shagbark hickory (*Carya ovata*), shellbark hickory (*C. laciniosa*), bitternut hickory (*C. cordiformis*), green ash (*Fraxinus pennsylvanica*), white ash (*F. americana*), eastern cottonwood (*Populus deltoides*), red oak (*Quercus rubra*), post oak (*Q. stellata*), white oak (*Q. alba*) slippery elm (*Ulmus rubra*), and American elm (*Ulmus americana*). In addition to theses species 3D/International, Incorporated (1995) listed sugar maple (*A. saccharum*), shingle oak (*Q. imbricaria*), and sassafras (*Sassafras albidum*) as class 2 trees. The class 2 trees are those species believed to be less important, but still have the necessary characteristics to be used as roosts. Trees normally used as primary roosts are typically dead and have a diameter at breast height (dbh) greater than 12 inches (3D/International Incorporated 1995). However, in some rare cases primary roosts have been found in large hollow live trees. Kurta *et al.* (1993) found a primary roost in a 22 inch dbh hollow sycamore (*Platanus occidentalis*) in Michigan. Roost trees often provide suitable habitat as maternity roost for only a short period of time. However, bats will use them in consecutive years, if they remain standing and have sloughing bark (Gardner *et al.* 1991, Callahan *et al.* 1997).

Food Habits

Historically, the Indiana bat was thought to prey primarily on moths (Lepidoptera), beetles (Coleoptera), true flies (Diptera), and caddisflies (Trichoptera) (Belwood 1979, Brack 1983, Brack and LaVal 1985). During a study by Belwood (1979), the primary insects consumed by females and juveniles in southern Indiana were Lepidoptera (57%), Diptera (18%), and Coleoptera (9%). Belwood's information was very similar to a three year study conducted by Brack (1983) throughout Indiana. Brack (1983) found that Indiana bats also consumed Lepidoptera (48%),Coleoptera (24%), and Diptera (8.5%). However, he found Trichoptera (9.8%) to be an important food source. Recent studies by Lee (1993) and Kurta and Whitaker (1998) found the same four insect orders were consumed by Indiana bats in central/northern Indiana and in Michigan. However, these studies showed that Indiana bats preyed much more on caddisflies in central/northern Indiana and in Michigan. The female Indiana bats in central and northern Indiana consumed 40% Lepidoptera, 29% Trichoptera, 13% Coleoptera, and 9% Diptera (Lee 1993). The most recent Indiana bat food habits study was conducted in Michigan at the northern limits of the species range. These bats consumed primarily Trichoptera (55.1%) and Diptera (25.5%) which have aquatic larvae (Kurta and Whitaker 1998). These authors hypothesized that Indiana bats in northern portions of their range feed more on aquatic insects than southern populations because they foraged primarily over streams and wetlands.

The only food habits information from Kentucky for Indiana bats is from Jackson County. Kiser and Elliott (1996) conducted a study to determine the food habits of male Indiana bats at a cave

entrance during autumn. During autumn in 1994 and 1995, male Indiana bats consumed primarily Lepidoptera (28.5% and 34.0%), Coleoptera (15.9% and 40.2%), Homoptera (15.3% and 4.5%), and Diptera (28.8 % and 18.8%) (Kiser and Elliott 1996). The increase in consumption of snout beetles (Coleoptera: Curculionidae) during the 1995 samples indicates that Indiana bats are opportunistic foragers.

Indiana bats forage primarily in upland, bottomland, and riparian forests (Cope *et al.* 1974, Humphrey *et al.* 1977, LaVal *et al.*1977, Belwood 1979), but they will also use forest and cropland edges, fallow fields, and areas of impounded water (Gardner *et al.* 1991). It has been documented that Indiana bats may travel up to three miles from their summer roosts to summer foraging areas and will visit these same areas each night. A pregnant female captured near Morehead, Kentucky maintained a very systematic travel pattern to reach an upland wildlife pond and woods that had been shelterwood cut (J. MacGregor and J. Kiser, unpublished data). This bat arrived at the pond and adjacent woods within a couple of minutes each night that it was tracked. Reproductively active females traveled a maximum mean distance of 1.5 miles from their roost trees to foraging areas in Illinois (Gardner *et al.* 1991). During a recent study by Pruitt *et al.* (1995) at the Jefferson Proving Ground (JPG), Jefferson County, Indiana, reproductive female bats were found to travel a mean distance of 1.7 miles from their original capture sites to their roost trees. Also at JPG, a male traveled 0.4 mile from the capture site to its roost; this distance is less, but similar to the distance of 0.7 mile found by Gardner *et al.* (1991) for males in Illinois.

Virginia big-eared bat

Winter and Summer Habitat

Virginia big-eared bats roost in caves during both the summer and winter. Caves used by these bats are typically located in karst regions dominated by oak-hickory or beech-maple-hemlock forests (Barbour and Davis 1969). Virginia big-eared bats hibernate in caves and mines where temperatures are 55° F or less, but generally above freezing. They have been found hibernating in temperatures as low as 28.5° F (Barbour and Davis 1969). In Kentucky and West Virginia, Virginia big-eared bats hibernate solitarily or in tight clusters of several hundred individuals. Winter colonies are usually larger than summer colonies and are composed equally of males and females, whereas summer colonies are smaller and divided into bachelor and maternity colonies (Barbour and Davis 1969).

Food Habits

Virginia big-eared bats are believed to feed primarily on small moths (micro-lepidoptera). They have also been found to consume other insects, including representatives of Neuroptera, Coleoptera, Diptera, and Hymenoptera (Hamilton 1943, Ross 1967, Whitaker *et al.* 1977). Virginia big-eared bats forage along canyon walls (Caire *et al.* 1984), on mountain slopes, forest edges along intermittent streams (Clark *et al.* 1993), and in old fields (Dalton *et al.* 1989, Burford and Lacki 1995). Distances traveled from roosts sites to foraging areas tend to vary

throughout their range. During a recent study by Adam *et al.* (1994) in the Daniel Boone National Forest, Kentucky, reproductive female bats were found to travel distances of 0.5 to 0.71 mile from their roosting site to foraging areas. These distances are smaller than estimates for the Virginia big-eared bat in Virginia where traveling averaged ≤2 miles (Dalton *et al.* 1989).

As to date a paucity of information exists of the breeding biology of the Virginia big-eared bat. Most of what is known is based on a single study by Pearson *et al.* (1952). Breeding among Virginia big-eared bats starts in early October and does not peak until late November into early February. Maternity colonies begin to form in late April and early May. Soon after maternity colonies form females give birth to a single young, usually from late May into early June. However, dates vary considerably in different colonies and in different years. Variability is most likely due to several factors; bats in colonies come from different hibernation sites, many arrive at different times, cold temperatures delay development and yearling bats often give birth later than older bats (Barbour and Davis 1969).

IV. METHODS

The methods used to conduct summer habitat field surveys for Indiana bats follow the mist netting guidelines (Appendix II) in the *Agency Draft Indiana Bat (Myotis sodalis) Revised Recovery Plan* [United States Fish and Wildlife Service (USFWS) 1999]. The recovery plan (page 53) states that there should be one net site per kilometer (0.6 mile) of stream and two net sites per square kilometer (247 acres) of forested habitat. Using these guidelines it was determined that 31 mist net sites would be required at the Sturgeon Creek site and eight nine net sites at the War Fork site (see Table 1).

Table 1. Number of mist net sites required (according to USFWS 1999) for proposed reservoir sites.

SITE	STREAMS (LENGTH)/NUMBER OF NET SITES	FORESTED HABITAT (AREA)/NUMBER OF NET SITES	TOTAL NUMBER OF NET SITES
Sturgeon Creek Site 1	14.08 km/14	2.12 sq km/4	18
Sturgeon Creek Site 2	19.84 km/20	2.99 sq km/6	26
Sturgeon Creek Site 3	23.04 km/23	3.77 sq km/8	31
War Fork	7.00 km/7	0.65 sq km/2	9

Each mist net site consists of at least two net sets where a net set is one to four mist nets hung between two poles. Poles are 10 to 30 feet high and have ropes affixed to them to raise and lower the nets. These net sets are located so that no individual set would interfere with the other set (at least 30 meters apart). The mist nets used have a mesh size of 1.5 inches, are constructed of 50 denier/2-ply nylon, and have a length of nine to 60 feet, depending on the corridor width. The bottom of the mist net was lowered to the water surface to prevent bats from flying under the nets while drinking water. Nets are tended from dusk (9:00 p.m.) until 2:00 a.m. local time each night. Topographic maps, field investigations, and personal communication with Jackson County residents were used to plan field activities. Parameters used for selecting exact net locations included: access, canopy closure, travel corridors, size and quality of the adjacent habitat, and the presence of water.

Access is the distance that netting equipment would need to be carried from the vehicle to the exact net locations. **Canopy closure** over a flight corridor increases the chances of capture because it prevents bats using the corridor from flying over the nets. A well defined **travel corridor** (such as a stream, road, or trail) with little interference from dense shrubs or subcanopy trees but with some canopy closure is where nets are set. Because Indiana bats have an aversion to major highways and require a relatively large woodland that contains trees with sloughing bark, **size and quality of the adjacent habitat** is important to the species. Previous experience has demonstrated that the **presence of water** at the net site increases the use of the area by bats. Bats often fly low over pools in streams and road ruts in woodlands to obtain water while foraging.

V. PRELIMINARY RESULTS

The field survey involved mist netting for Indiana and Virginia big-eared bats at 12 sites, eight on the proposed Sturgeon Creek site and four on the proposed War Fork site (see attached project location maps, Tables 2 and 3). At least two mist net sets were erected at each of these sites for a night. If each net set per night counted as a net-night, then 16 net-nights were conducted on Sturgeon Creek and 13 net-nights were conducted on War Fork.

All bats captured were carefully removed from the net and identified to species. All bats were banded with either Hughes celluloid bands (2.3 mm) or Lambournes metal rings to identify them if they were caught again that night or encountered during other studies. The band number, species, sex, forearm length, weight, reproductive condition, age, mist net site, and time of capture were recorded. All bats were released unharmed at the point of capture. No bats were injured, killed or retained as specimens during this project.

During three nights of netting (with 2-3 teams/night, 8 sites) on Sturgeon Creek a total of 128 bats of five species were captured (Table 4). All species captured are common bats, and include the red bat (*Lasiurus borealis*) (70), eastern pipistrelle (*Pipistrellus subflavus*) (34), northern long-eared bat (*Myotis septentrionalis*) (12), big brown bat (*Eptesicus fuscus*) (11), and a single little brown bat (*Myotis lucifugus*). The capture of 128 bats during three nights of effort (with 2-

3 teams/night, 8 sites) resulted in a capture rate of 16 bats/night. This capture success is higher than average for riparian habitats in forested areas and indicates that this area provides excellent foraging and drinking habitat for bats.

During two nights of netting (with 1-3 teams/night, 4 sites) on War Fork a total of 85 bats of five species were captured (Table 5). All species captured are common bats, and included the red bat (62), eastern pipistrelle (10), northern long-eared bat (8), little brown bat (4), and a single big brown bat. The capture of 85 bats during two nights of effort (with 1-3 teams/night, 4 sites) resulted in a capture rate of 42.5 bats/night. This capture success is higher than average for riparian habitats in forested areas and indicates that this area provides excellent foraging and drinking habitat for bats.

VI. SUMMARY

A total of eight net sites were mist netted on the proposed Sturgeon Creek site and four net sites were mist netted on the proposed War Fork site. The remaining 23 mist net sites for Sturgeon Creek and five remaining mist net sites for War Fork will be surveyed during the 2000 summer mist netting season. In addition, a complete cliffline survey of both sites will be completed during the summer of 2000 to determine whether summer habitat for Virginia big-eared bats is present. Surveys will be conducted in areas of sandstone and limestone rock outcroppings (see geologic project location maps). It should also be noted that the winter habitat [i.e., hibernacula (caves, rockshelters, mine portals)] survey for Indiana and Virginia big-eared bats will be conducted in November (1999) through January (2000) and the results will be included in the final report.

No Indiana or Virginia big-eared bats have been captured during mist netting activities at the proposed Sturgeon and War Fork reservoir sites in Jackson County, Kentucky. A total of 128 bats of five species was captured on Sturgeon Creek (Table 6) and a total 85 bats of five species was captured on War Fork (Table 7). The five bat species captured included eastern red bat, eastern pipistrelle bat, northern long-eared bat, big brown bat and little brown bat. These species are widely dispersed in Kentucky and are commonly captured in a variety of habitats. Although no federally protected species were captured during mist netting efforts at the proposed Sturgeon and War Fork reservoir sites, the forest and rockshelters along both of these streams provides potential foraging and roosting habitat for Indiana and Virginia big-eared bats.

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Table 2. Date surveyed, site and location, number of net sets, county and state, and quadrangle map for mist netting sites at the proposed Sturgeon Creek reservoir site, Jackson County, Kentucky.

Date	Site and Location	Number of Net Sets	County, State	Quadrangle Map
8/10/99	A Sturgeon Creek	2	Jackson Co., Kentucky	Sturgeon
8/10/99	B Sturgeon Creek	2	Jackson Co., Kentucky	Sturgeon
8/11/99	C Sturgeon Creek	2	Jackson Co., Kentucky	Sturgeon
8/11/99	D Sturgeon Creek	2	Jackson Co., Kentucky	Sturgeon
8/11/99	E Sturgeon Creek	2	Jackson Co., Kentucky	Sturgeon
8/12/99	F Sturgeon Creek	2	Jackson Co., Kentucky	Sturgeon
8/12/99	G Sturgeon Creek	2	Jackson Co., Kentucky	Sturgeon
8/12/99	H Sturgeon Creek	2	Jackson Co., Kentucky	Sturgeon

Table 3. Date surveyed, site and location, number of net sets, county and state, and quadrangle map for mist netting sites at the proposed War Fork reservoir site, Jackson County, Kentucky.

Date	Site and Location	Number of Net Sets	County, State	Quadrangle Map
8/13/99	I War Fork	3	Jackson Co., Kentucky	Sturgeon
8/13/99	J War Fork	3	Jackson Co., Kentucky	Sturgeon
8/13/99	K War Fork	4	Jackson Co., Kentucky	Sturgeon
8/14/99	L War Fork	3	Jackson Co., Kentucky	Sturgeon

Table 4. Bat species captured during mist netting activities at the proposed Sturgeon Creek reservoir site, Jackson County, Kentucky, August 10 through August 14, 1999.

Date	Site Number	Band Number	Species	Sex	Forearm Length (mm)	Weight (g)	Reproductive Condition	Age	Time of Capture
8/10/99	A	A00586	*Eptesicus fuscus*	M	45	13.4	Non-reprod.	Adult	10:30
8/10/99	A	A00594	*Lasiurus borealis*	M	36	10.4	Non-reprod.	Adult	11:00
8/10/99	A	A00579	*Myotis septentrionalis*	M	35	6.2	Non-reprod.	Adult	12:45
8/10/99	B	DNB	*Pipistrellus subflavus*	F	33	4.7	Non-reprod.	YOY	9:03
8/10/99	B	DNB	*Lasiurus borealis*	M	40	8.6	Non-reprod.	YOY	9:10
8/10/99	B	DNB	*Pipistrellus subflavus*	M	32	4.8	Non-reprod.	YOY	9:45
8/10/99	B	DNB	*Lasiurus borealis*	F	44	10.6	Non-reprod.	YOY	9:45
8/10/99	B	A00751	*Lasiurus borealis*	F	44	12.3	Non-reprod.	Adult	9:45
8/10/99	B	A00752	*Lasiurus borealis*	F	38	9.0	Non-reprod.	Adult	9:45
8/10/99	B	A00753	*Pipistrellus subflavus*	F	34	5.6	Post-lactating	Adult	9:45
8/10/99	B	A00754	*Lasiurus borealis*	F	42	12.0	Non-reprod.	Adult	10:15
8/10/99	B	A00755	*Lasiurus borealis*	F	44	11.0	Non-reprod.	YOY	10:22
8/10/99	B	A00756	*Myotis septentrionalis*	M	36	5.2	Non-reprod.	Adult	11:09
8/10/99	B	A00757	*Lasiurus borealis*	F	43	11.2	Non-reprod.	YOY	11:50
8/10/99	B	A00758	*Myotis lucifugus*	M	35	5.4	Non-reprod.	Adult	11:53

Table 4. Continued.

8/11/99	D	A00768	*Myotis septentrionalis*	M	34	4.6	Non-reprod.	YOY	11:09
8/11/99	D	A00769	*Lasiurus borealis*	F	40	11.4	Non-reprod.	YOY	11:32
8/11/99	D	A00770	*Myotis septentrionalis*	M	34	6.0	Non-reprod.	YOY	11:57
8/11/99	D	A00771	*Lasiurus borealis*	M	39	8.6	Non-reprod.	YOY	12:15
8/11/99	D	A00772	*Lasiurus borealis*	F	38	11.2	Non-reprod.	YOY	1:06
8/11/99	D	A00773	*Lasiurus borealis*	M	39	9.2	Non-reprod.	YOY	1:16
8/11/99	D	DNB	*Myotis septentrionalis*	GON	33	GON	GON	GON	1:45
8/11/99	E	A00519	*Pipistrellus subflavus*	F	31	5.5	Non-reprod.	Adult	8:43
8/11/99	E	A00518	*Pipistrellus subflavus*	M	32	4.9	Non-reprod.	Adult	8:45
8/11/99	E	A00517	*Lasiurus borealis*	M	36	7.5	Non-reprod.	YOY	9:15
8/11/99	E	A00516	*Myotis septentrionalis*	F	33	5.9	Non-reprod.	Adult	9:15
8/11/99	E	A00515	*Eptesicus fuscus*	M	45	15.7	Non-reprod.	Adult	9:21
8/11/99	E	A00514	*Pipistrellus subflavus*	F	30	5.6	Non-reprod.	YOY	9:21
8/11/99	E	A00513	*Lasiurus borealis*	M	38	10.7	Non-reprod.	Adult	9:21
8/11/99	E	A00512	*Lasiurus borealis*	F	39	10.0	Non-reprod.	Adult	9:45
8/11/99	E	A00511	*Lasiurus borealis*	M	38	9.4	Non-reprod.	Adult	9:45
8/11/99	E	A00510	*Lasiurus borealis*	M	36	9.1	Non-reprod.	Adult	9:45
8/11/99	E	A00509	*Lasiurus borealis*	F	38	10.3	Non-reprod.	Adult	9:45
8/11/99	E	A00508	*Lasiurus borealis*	F	40	10.4	Non-reprod.	Adult	9:45

Table 4. Continued.

8/11/99	E	A00507	*Lasiurus borealis*	M	37	9.5	Non-reprod.	Adult	10:03
8/11/99	E	A00506	*Lasiurus borealis*	M	36	7.9	Non-reprod.	Adult	10:03
8/11/99	E	A00504	*Lasiurus borealis*	M	47	8.1	Non-reprod.	Adult	10:03
8/11/99	E	A00505	*Eptesicus fuscus*	M	43	14.8	Non-reprod.	Adult	10:05
8/11/99	E	A00503	*Lasiurus borealis*	F	39	11.0	Non-reprod.	Adult	10:08
8/11/99	E	A00502	*Lasiurus borealis*	M	37	10.6	Non-reprod.	Adult	10:20
8/11/99	E	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	10:20
8/11/99	E	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	10:22
8/11/99	E	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	10:22
8/11/99	E	A00700	*Pipistrellus subflavus*	F	32	5.0	Non-reprod.	Adult	10:43
8/11/99	E	DNB	*Pipistrellus subflavus*	M	32	5.0	Non-reprod.	Adult	10:45
8/11/99	E	A00501	*Lasiurus borealis*	M	37	10.2	Non-reprod.	Adult	10:47
8/11/99	E	A00699	*Lasiurus borealis*	M	37	8.4	Non-reprod.	Adult	10:49
8/11/99	E	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	10:58
8/11/99	E	GON	*Pipistrellus subflavus*	GON	GON	GON	GON	GON	10:58
8/11/99	E	A00698	*Pipistrellus subflavus*	F	31	5.4	Non-reprod.	YOY	11:08
8/11/99	E	GON	*Pipistrellus subflavus*	GON	GON	GON	GON	GON	11:08
8/11/99	E	A00697	*Pipistrellus subflavus*	F	32	6.2	Non-reprod.	Adult	11:16

Table 4. Continued.

8/11/99	E	A00696	*Pipistrellus subflavus*	M	32	4.7	Non-reprod.	Adult	11:30
8/11/99	E	A00695	*Pipistrellus subflavus*	F	31	5.2	Non-reprod.	YOY	11:33
8/11/99	E	A00694	*Pipistrellus subflavus*	M	31	4.5	Non-reprod.	Adult	11:40
8/11/99	E	A00693	*Lasiurus borealis*	M	38	8.4	Non-reprod.	Adult	11:40
8/11/99	E	A00692	*Eptesicus fuscus*	M	43	13.0	Non-reprod.	Adult	11:58
8/11/99	E	A00691	*Lasiurus borealis*	F	39	9.7	Non-reprod.	Adult	11:58
8/11/99	E	A00690	*Lasiurus borealis*	M	38	10.4	Non-reprod.	Adult	12:07
8/11/99	E	A00689	*Pipistrellus subflavus*	F	32	4.6	Non-reprod.	YOY	12:10
8/11/99	E	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	12:14
8/11/99	E	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	12:18
8/11/99	E	A00688	*Pipistrellus subflavus*	M	32	4.9	Non-reprod.	Adult	12:30
8/11/99	E	A00687	*Lasiurus borealis*	F	38	8.3	Non-reprod.	Adult	12:30
8/11/99	E	A00686	*Eptesicus fuscus*	F	46	13.8	Non-reprod.	Adult	12:39
8/11/99	E	A00685	*Eptesicus fuscus*	M	43	14.9	Non-reprod.	Adult	12:39
8/11/99	E	A00684	*Eptesicus fuscus*	M	43	16.0	Non-reprod.	Adult	12:39
8/11/99	E	A00683	*Lasiurus borealis*	M	37	9.1	Non-reprod.	Adult	12:39
8/11/99	E	A00682	*Lasiurus borealis*	F	40	8.9	Non-reprod.	Adult	12:39
8/11/99	E	GON	*Pipistrellus subflavus*	GON	GON	GON	GON	GON	12:39

Table 4. Continued.

8/11/99	E	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	12:57
8/11/99	E	A00681	*Pipistrellus subflavus*	F	33	5.6	Non-reprod.	Adult	1:01
8/11/99	E	A00680	*Lasiurus borealis*	F	39	11.4	Non-reprod.	Adult	1:05
8/11/99	E	A00679	*Pipistrellus subflavus*	M	31	5.2	Non-reprod.	Adult	1:05
8/11/99	E	A00678	*Eptesicus fuscus*	M	43	15.5	Non-reprod.	Adult	1:07
8/11/99	E	A00677	*Pipistrellus subflavus*	M	31	5.2	Non-reprod.	YOY	1:07
8/11/99	E	GON	*Pipistrellus subflavus*	GON	GON	GON	GON	GON	1:39
8/11/99	E	A00676	*Lasiurus borealis*	F	40	10.9	Non-reprod.	Adult	1:44
8/11/99	E	A00675	*Pipistrellus subflavus*	F	33	5.0	Non-reprod.	YOY	1:44
8/11/99	E	A00674	*Lasiurus borealis*	F	39	10.1	Non-reprod.	Adult	1:45
8/11/99	E	GON	*Pipistrellus subflavus*	GON	GON	GON	GON	GON	1:49
8/11/99	E	A00673	*Myotis septentrionalis*	M	34	6.6	Non-reprod.	Adult	1:50
8/11/99	E	A00672	*Lasiurus borealis*	F	38	10.2	Non-reprod.	Adult	1:54
8/11/99	E	GON	*Pipistrellus subflavus*	GON	GON	GON	GON	GON	1:56
8/11/99	E	A00671	*Lasiurus borealis*	F	39	11.6	Non-reprod.	Adult	2:12
8/11/99	E	GON	*Pipistrellus subflavus*	GON	GON	GON	GON	GON	2:14
8/11/99	E	A00670	*Myotis septentrionalis*	F	33	7.3	Non-reprod.	Adult	2:20
8/11/99	E	A00669	*Lasiurus borealis*	M	37	8.5	Non-reprod.	Adult	2:21

Table 4. Continued.

8/11/99	E	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	2:22
8/12/99	F	A00596	*Lasiurus borealis*	F	41	10.4	Non-reprod.	Adult	9:00
8/12/99	F	A00582	*Pipistrellus subflavus*	M	32	5.4	Non-reprod.	Adult	9:15
8/12/99	F	A00801	*Myotis septentrionalis*	F	34	5.8	Non-reprod.	Adult	9:30
8/12/99	F	A00802	*Pipistrellus subflavus*	F	34	6.0	Non-reprod.	Adult	9:45
8/12/99	F	A00803	*Eptesicus fuscus*	F	47	21.4	Pregnant	Adult	10:30
8/12/99	G	A00775	*Pipistrellus subflavus*	M	31	5.8	Non-reprod.	YOY	9:50
8/12/99	G	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	9:20
8/12/99	G	GON	*Eptesicus fuscus*	GON	GON	GON	GON	GON	10:20
8/12/99	G	A00774	*Lasiurus borealis*	F	38	11.2	Non-reprod.	YOY	10::48
8/12/99	H	GON	*Pipistrellus subflavus*	GON	GON	GON	GON	GON	8:39
8/12/99	H	A00668	*Lasiurus borealis*	M	38	11.4	Non-reprod.	Adult	8:39
8/12/99	H	A00667	*Eptesicus fuscus*	M	43	18.4	Non-reprod.	Adult	9:08
8/12/99	H	A00666	*Pipistrellus subflavus*	F	33	5.3	Non-reprod.	YOY	9:30
8/12/99	H	A00665	*Pipistrellus subflavus*	F	32	6.2	Non-reprod.	Adult	9:30
8/12/99	H	A00664	*Pipistrellus subflavus*	M	32	5.3	Non-reprod.	YOY	9:30
8/12/99	H	A00663	*Lasiurus borealis*	F	41	11.7	Non-reprod.	Adult	9:30
8/12/99	H	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	9:36

Table 4. Continued.

8/12/99	H	A00662	*Myotis septentrionalis*	F	36	6.6	Non-reprod.	Adult	10:00
8/12/99	H	A00661	*Lasiurus borealis*	M	38	8.9	Non-reprod.	Adult	10:29
8/12/99	H	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	10:55
8/12/99	H	A00660	*Myotis septentrionalis*	M	32	5.7	Non-reprod.	Adult	12:40
8/12/99	H	A00659	*Pipistrellus subflavus*	M	32	4.9	Non-reprod.	YOY	2:04

M = Male
F = Female
DNB = Did not band
GON = Got out of net
Non-reprod. = non-reproductive
YOY = Young of Year

Table 5. Bat species captured during mist netting activities at the proposed War Fork reservoir site, Jackson County, Kentucky, August 10 through August 14, 1999.

Date	Site Number	Band Number	Species	Sex	Forearm Length (mm)	Weight (g)	Reproductive Condition	Age	Time of Capture
8/13/99	I	A00804	*Lasiurus borealis*	M	40	10.2	Scrotal	Adult	9:15
8/13/99	I	A00805	*Lasiurus borealis*	F	41	12.6	Non-reprod.	Adult	9:35
8/13/99	I	A00806	*Lasiurus borealis*	M	39	10.2	Scrotal	Adult	10:45
8/13/99	I	A00807	*Lasiurus borealis*	M	38	9.4	Scrotal	Adult	11:30
8/13/99	I	GON	*Lasiurus borealis*	F	GON	GON	GON	Adult	11:30
8/13/99	I	A00808	*Lasiurus borealis*	M	40	11.0	Scrotal	Adult	1:00
8/13/99	J	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	9:10
8/13/99	J	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	9:15
8/13/99	J	A00777	*Myotis septentrionalis*	F	4.2	33	Non-reprod.	YOY	9:15
8/13/99	J	A00778	*Lasiurus borealis*	M	8.6	35	Scrotal	Adult	9:18
8/13/99	J	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	9:20
8/13/99	J	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	9:20
8/13/99	J	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	9:30
8/13/99	J	A00779	*Lasiurus borealis*	M	8.8	34	Scrotal	Adult	10:14
8/13/99	J	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	10:25
8/13/99	J	DNB	*Myotis septentrionalis*	M	5.0	32	Non-reprod.	YOY	12:15

Table 5. Continued.

8/13/99	J	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	1:00
8/13/99	J	A00880	*Lasiurus borealis*	F	9.8	37	Non-reprod.	Adult	1:47
8/13/99	J	A00887	*Lasiurus borealis*	M	9.4	38	Scrotal	Adult	1:50
8/13/99	K	A00658	*Lasiurus borealis*	M	8.6	39	Non-reprod.	Adult	8:54
8/13/99	K	A00657	*Lasiurus borealis*	M	11.2	38	Non-reprod.	Adult	8:58
8/13/99	K	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	9:01
8/13/99	K	A00656	*Lasiurus borealis*	F	9.4	38	Non-reprod.	Adult	9:02
8/13/99	K	GON	*Eptesicus fuscus*	GON	GON	GON	GON	GON	9:04
8/13/99	K	A00654	*Pipistrellus subflavus*	M	5.0	31	Non-reprod.	Adult	9:08
8/13/99	K	A00653	*Pipistrellus subflavus*	M	5.2	33	Non-reprod.	Adult	9:08
8/13/99	K	DNB	*Lasiurus borealis*	M	8.9	37	Non-reprod.	Adult	9:10
8/13/99	K	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	9:12
8/13/99	K	A00651	*Pipistrellus subflavus*	M	5.8	32	Non-reprod.	Adult	9:17
8/13/99	K	A00701	*Pipistrellus subflavus*	M	5.1	31	Non-reprod.	Adult	9:20
8/13/99	K	A00652	*Myotis septentrionalis*	F	5.4	34	Non-reprod.	Adult	9:22
8/13/99	K	A00702	*Lasiurus borealis*	F	15.6	39	Non-reprod.	Adult	9:24
8/13/99	K	GON	*Pipistrellus subflavus*	GON	GON	GON	GON	GON	9:33
8/13/99	K	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	9:34
8/13/99	K	A00655	*Lasiurus borealis*	M	8.9	39	Non-reprod.	Adult	9:02

Table 5. Continued.

8/13/99	K	A00703	*Lasiurus borealis*	F	16.4	39	Non-reprod.	Adult	10:42
8/13/99	K	A00704	*Lasiurus borealis*	M	10.5	40	Non-reprod.	Adult	10:43
8/13/99	K	A00705	*Lasiurus borealis*	M	9.6	37	Non-reprod.	Adult	10:50
8/13/99	K	A00706	*Lasiurus borealis*	M	4.4	29	Non-reprod.	YOY	10:50
8/13/99	K	A00707	*Lasiurus borealis*	F	12.7	39	Non-reprod.	Adult	10:53
8/13/99	K	A00708	*Lasiurus borealis*	M	10.4	37	Non-reprod.	Adult	11:43
8/13/99	K	A00709	*Lasiurus borealis*	M	9.4	37	Non-reprod.	Adult	11:45
8/13/99	K	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	11:47
8/13/99	K	A00710	*Lasiurus borealis*	F	12.6	40	Non-reprod.	Adult	11:56
8/13/99	K	A00711	*Lasiurus borealis*	M	9.4	37	Non-reprod.	Adult	12:27
8/13/99	K	A00713	*Lasiurus borealis*	F	10.9	39	Non-reprod.	Adult	12:28
8/13/99	K	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	12:57
8/13/99	K	A00712	*Myotis septentrionalis*	M	6.0	36	Non-reprod.	Adult	12:57
8/13/99	K	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	12:59
8/13/99	K	A00714	*Lasiurus borealis*	M	9.2	39	Non-reprod.	Adult	1:16
8/13/99	K	A00716	*Lasiurus borealis*	M	9.1	37	Non-reprod.	Adult	1:26
8/13/99	K	GON	*Pipistrellus subflavus*	GON	GON	GON	GON	GON	1:26
8/13/99	K	A00717	*Lasiurus borealis*	F	11.0	41	Non-reprod.	Adult	1:27
8/13/99	K	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	1:28

Table 5. Continued.

8/13/99	K	A00718	*Lasiurus borealis*	M	9.5	38	Non-reprod.	Adult	1:28
8/13/99	K	GON	*Pipistrellus subflavus*	GON	GON	GON	GON	GON	1:28
8/13/99	K	A00720	*Lasiurus borealis*	F	12.0	43	Non-reprod.	Adult	1:42
8/13/99	K	A00719	*Myotis septentrionalis*	M	6.6	34	Non-reprod.	Adult	1:42
8/13/99	K	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	1:42
8/13/99	K	A00722	*Lasiurus borealis*	M	9.5	36	Non-reprod.	Adult	1:42
8/13/99	K	A00721	*Pipistrellus subflavus*	M	4.5	31	Non-reprod.	Adult	2:14
8/13/99	K	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	2:15
8/13/99	K	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	2:16
8/13/99	K	GON	*Lasiurus borealis*	GON	GON	GON	GON	GON	2:18
8/13/99	K	A00723	*Myotis septentrionalis*	M	7.0	32	Non-reprod.	Adult	2:28
8/13/99	K	A00724	*Myotis lucifugus*	M	6.6	34	Non-reprod.	Adult	2:28
8/13/99	K	A00725	*Lasiurus borealis*	F	11.9	39	Non-reprod.	Adult	2:29
8/13/99	K	A00715	*Myotis septentrionalis*	F	6.0	34	Non-reprod.	Adult	12:58
8/14/99	L	A00809	*Lasiurus borealis*	F	11.0	39	Non-reprod.	Adult	9:15
8/14/99	L	A00810	*Myotis septentrionalis*	F	6.6	35	Non-reprod.	Adult	9:15
8/14/99	L	A00811	*Lasiurus borealis*	M	12.0	39	Scrotal	Adult	9:15
8/14/99	L	A00812	*Lasiurus borealis*	M	10.4	38	Scrotal	Adult	9:15
8/14/99	L	A00813	*Lasiurus borealis*	M	9.8	41	Scrotal	Adult	10:00

Table 5. Continued.

8/14/99	L	A00814	*Lasiurus borealis*	F	12.0	43	Non-reprod.	Adult	10:00
8/14/99	L	A00815	*Lasiurus borealis*	F	11.0	40	Non-reprod.	Adult	10:00
8/14/99	L	A00816	*Pipistrellus subflavus*	M	5.8	33	Scrotal	Adult	10:15
8/14/99	L	A00817	*Pipistrellus subflavus*	M	5.8	32	Scrotal	Adult	10:15
8/14/99	L	A00818	*Myotis lucifugus*	M	8.8	37	Scrotal	Adult	10:30
8/14/99	L	A00819	*Lasiurus borealis*	M	10.6	37	Scrotal	Adult	10:45
8/14/99	L	A00820	*Lasiurus borealis*	M	9.4	38	Scrotal	Adult	11:15
8/14/99	L	A00821	*Myotis lucifugus*	M	7.6	36	Scrotal	Adult	11:15
8/14/99	L	A00822	*Lasiurus borealis*	M	10.0	40	Scrotal	Adult	11:45
8/14/99	L	A00824	*Lasiurus borealis*	F	13.2	43	Non-reprod.	Adult	12:00
8/14/99	L	A00825	*Myotis lucifugus*	M	7.8	32	Scrotal	Adult	12:45
8/14/99	L	A00826	*Lasiurus borealis*	F	11.0	39	Non-reprod.	Adult	1:30

M = Male
F = Female
DNB = Did not band
GON = Got out of net
Non-reprod. = non-reproductive
YOY = Young of Year

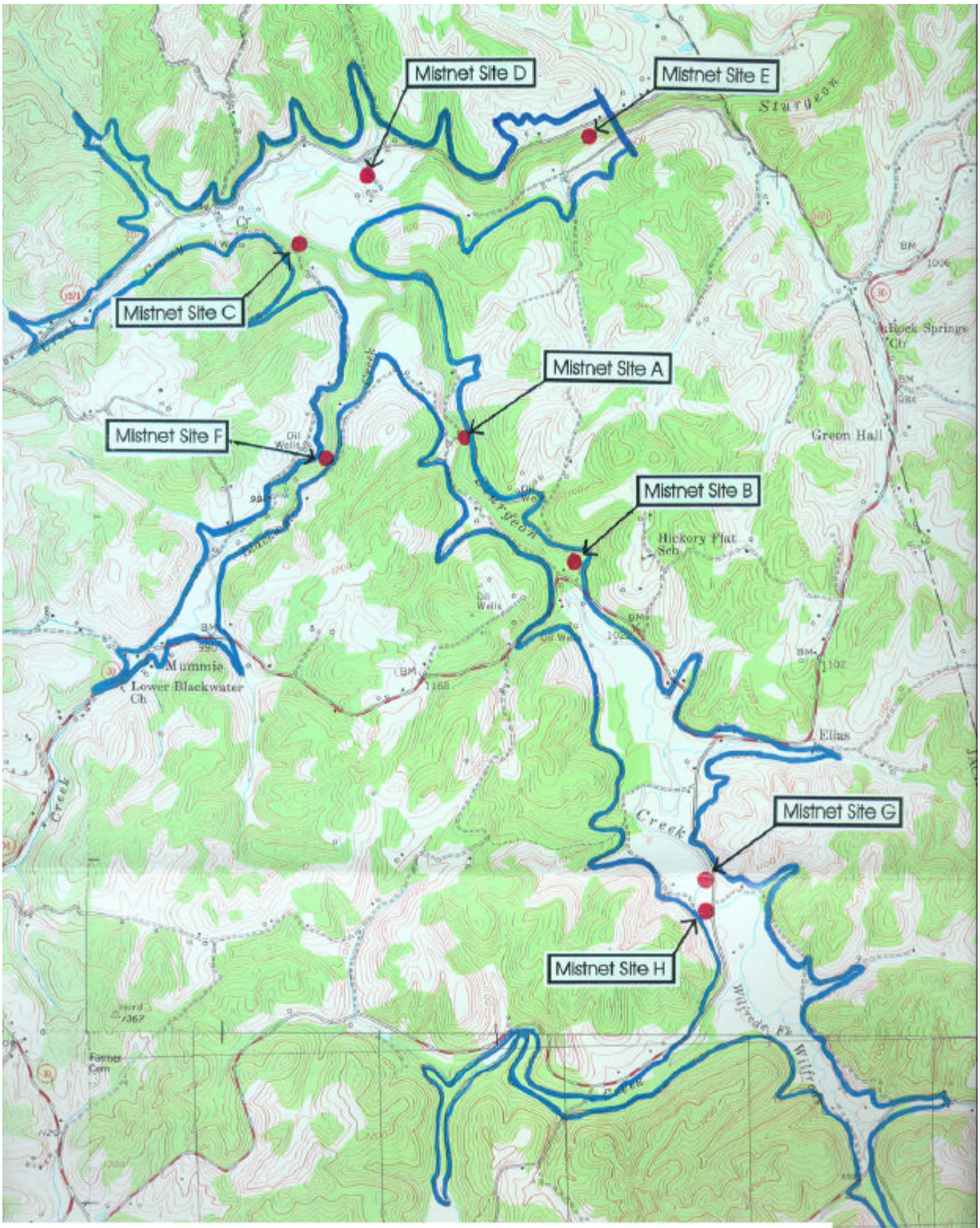
Table 6. Total of each bat species captured at the proposed Sturgeon Creek Reservoir site in Jackson County, Kentucky. Table includes bat species captured, reproductive status, percent reproductive, bats escaped from net and percent of total species captured.

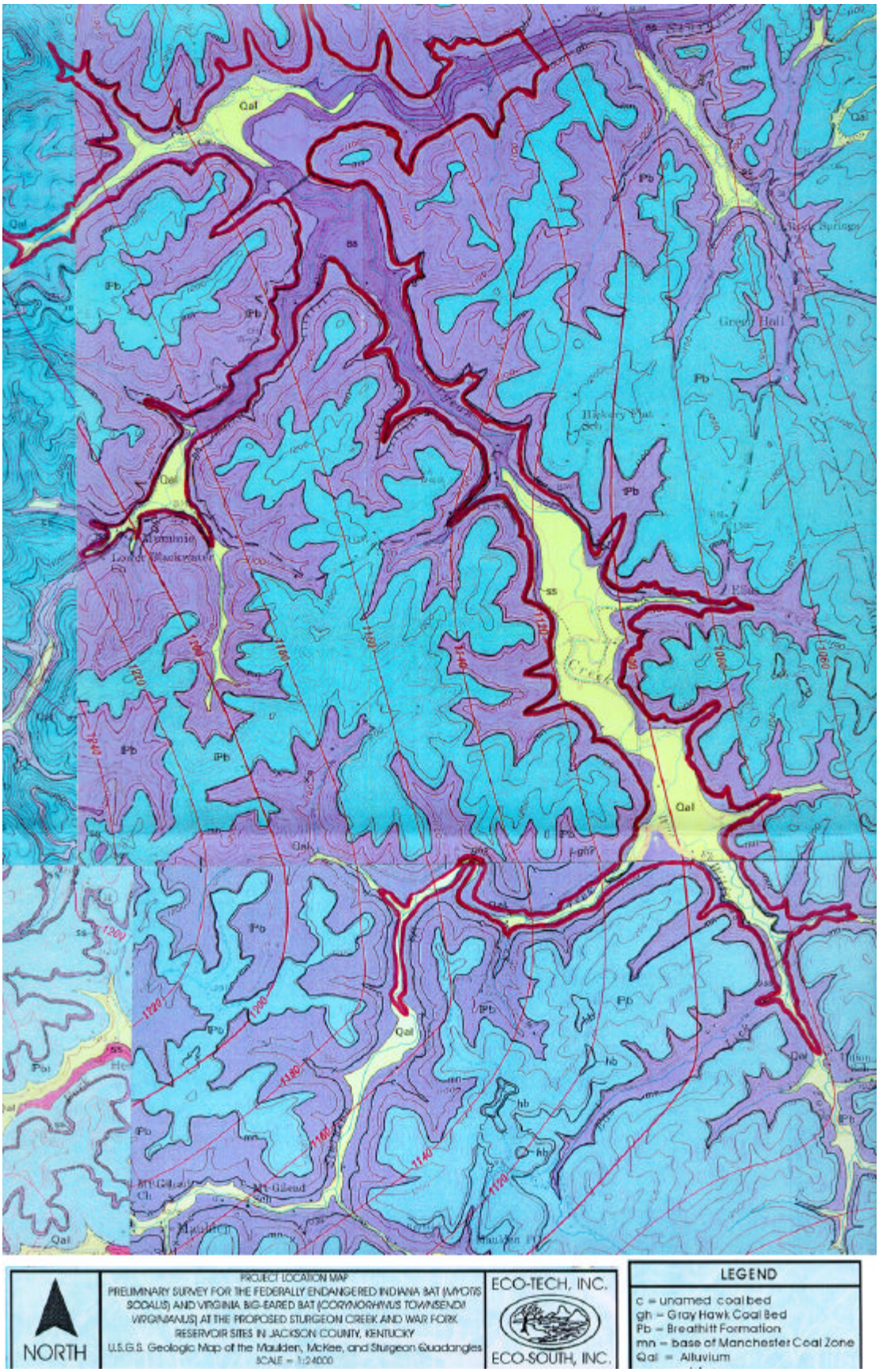
Species	Adult Male	Total and Percent of Reproductive Males	Young of Year Male	Adult Female	Total and Percent of Pregnant Females	Total and Percent of Post-lactating Females	Young of Year Females	Bats Escaped From Net	Total Captured	Percent of Total Captured
Eptesicus fuscus	8	0	0	2	1, 50%	0	0	1	11	8.6%
Myotis lucifugus	1	0	0	0	0	0	0	0	1	0.8%
Myotis septentrionalis	4	0	2	5	0	1, 20.0%	0	1	12	9.4%
Lasiurus borealis	25	5, 20.0%	5	23	0	0	6	11	70	54.5%
Pipistrellus subflavus	8	0	4	7	0	2, 28.6%	7	8	34	26.6%
Total Bats Captured									128	

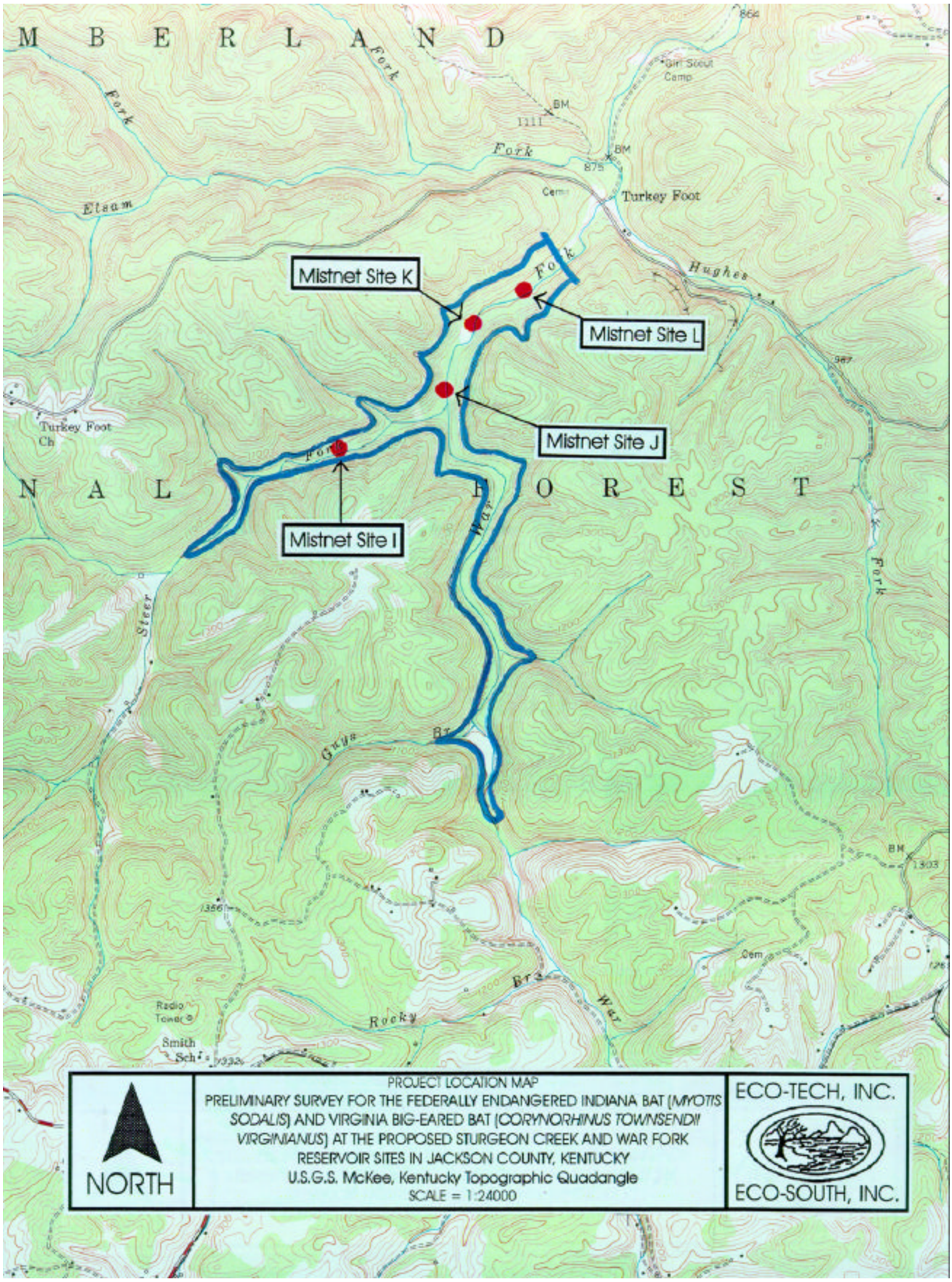
Table 7. Total of each bat species captured at the proposed War Fork Reservoir site in Jackson County, Kentucky. Table includes bat species captured, reproductive status, percent reproductive, bats escaped from net and percent of total species captured.

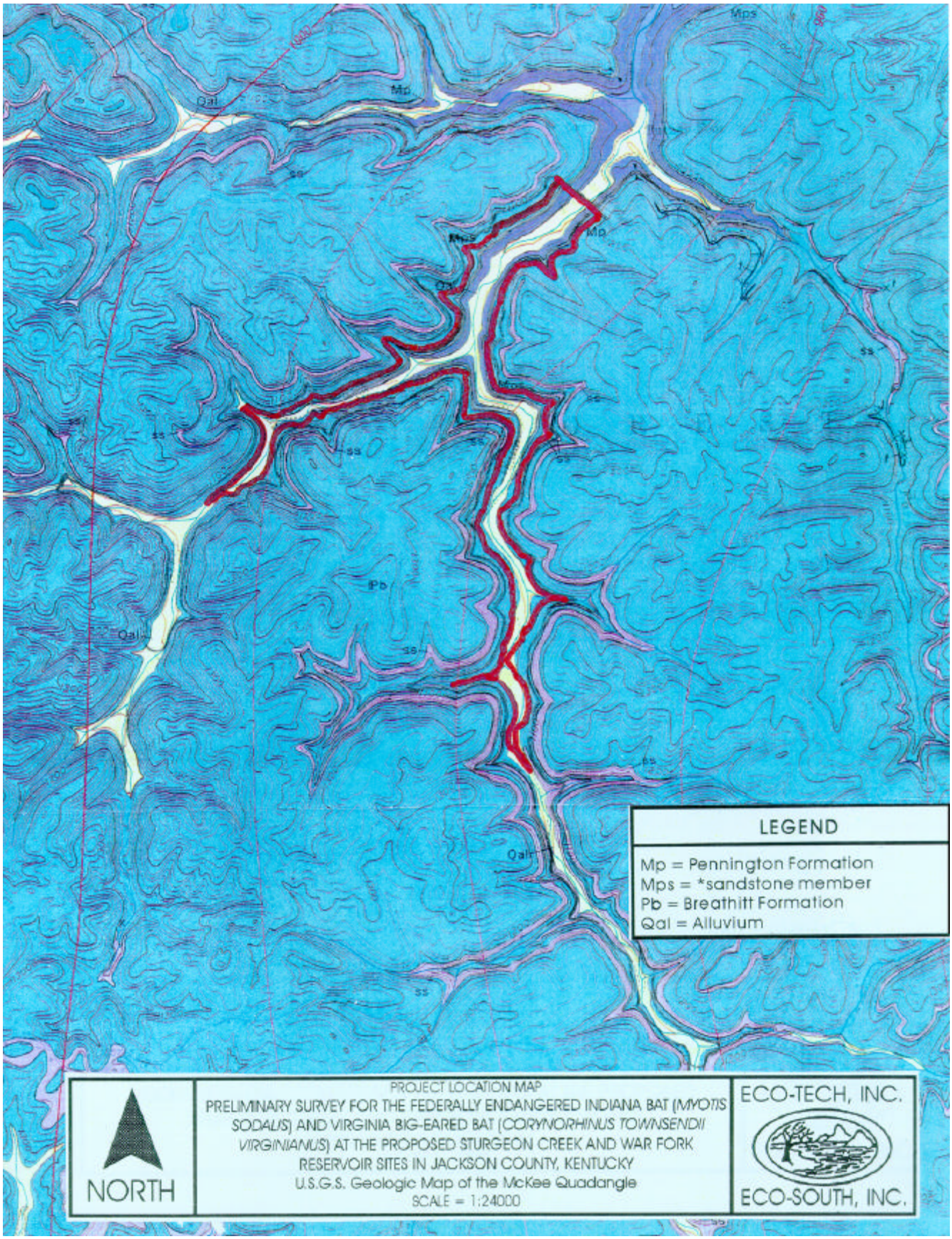
Species	Adult Male	Total and Percent of Reproductive Males	Young of Year Male	Adult Female	Total and Percent of Pregnant Females	Total and Percent of Post-lactating Females	Young of Year Females	Bats Escaped From Net	Total Captured	Percent of Total Captured
Eptesicus fuscus	ND	ND	ND	ND	ND	ND	ND	1	1	1.2%
Myotis lucifugus	4	3, 75.0%	0	0	0	0	0	0	4	4.7%
Myotis septentrionalis	3	0	1	4	0	0	0	0	8	9.4%
Lasiurus borealis	26	7	1	17	0	0	0	18	62	72.9%
Pipistrellus subflavus	7	2, 28.5%	0	0	0	0	0	3	10	11.8%
Total Bats Captured									85	

ND not determined

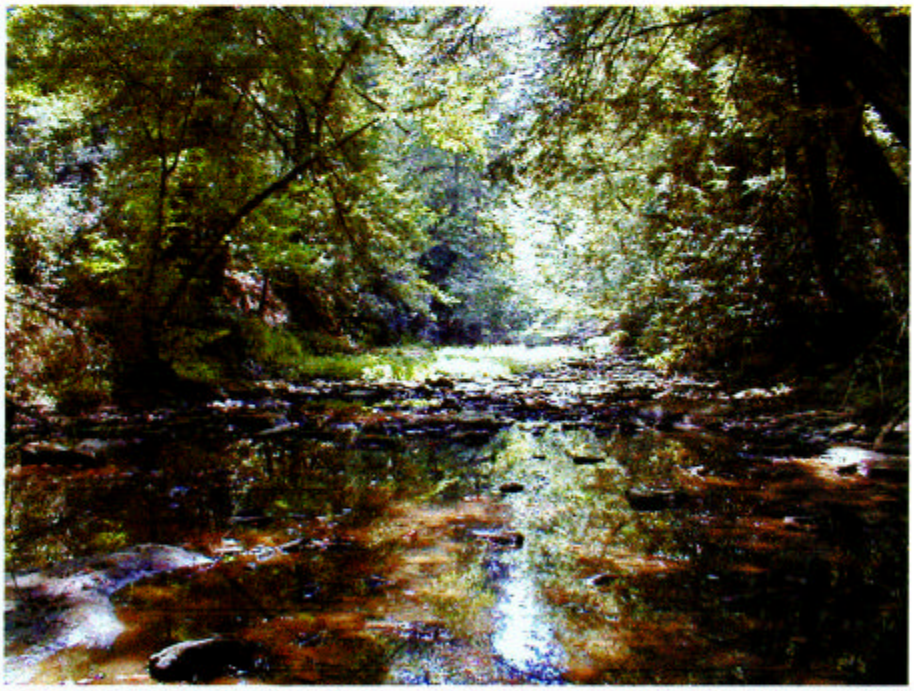

Mistnet Site D
Mistnet Site E
Mistnet Site C
Mistnet Site A
Mistnet Site F
Mistnet Site B
Mistnet Site G
Mistnet Site H
Sturgeon
Green Hall
Hickory Flat Sch
Mummie
Lower Blackwater Ch
Elias
Creek
Farmer Cem
NORTH
PROJECT LOCATION MAP
PRELIMINARY SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (MYOTIS SODALIS) AND VIRGINIA BIG-EARED BAT (CORYNORHINUS TOWNSENDII VIRGINIANUS) AT THE PROPOSED STURGEON CREEK AND WAR FORK RESERVOIR SITES IN JACKSON COUNTY, KENTUCKY
U.S.G.S. Moulden, McKee, Tyner, and Sturgeon Kentucky Topographic Quadrangles
SCALE = 1:24000
ECO-TECH, INC.
ECO-SOUTH, INC.


NORTH
PROJECT LOCATION MAP
PRELIMINARY SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (MYOTIS SODALIS) AND VIRGINIA BIG-EARED BAT (CORYNORHINUS TOWNSENDII VIRGINIANUS) AT THE PROPOSED STURGEON CREEK AND WAR FORK RESERVOIR SITES IN JACKSON COUNTY, KENTUCKY
U.S.G.S. Geologic Map of the Mauldin, McKee, and Sturgeon Quadrangles
SCALE = 1:24000
ECO-TECH, INC.
ECO-SOUTH, INC.
LEGEND
c = unamed coal bed
gh = Gray Hawk Coal Bed
Pb = Breathitt Formation
mn = base of Manchester Coal Zone
Qal = Alluvium


Mistnet Site K
Mistnet Site L
Mistnet Site J
Mistnet Site I
Turkey Foot
Turkey Foot Ch
Girl Scout Camp
Cem
Hughes
Steer
Rocky
Radio Tower
Smith Sch
NORTH
PROJECT LOCATION MAP
PRELIMINARY SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (MYOTIS SODALIS) AND VIRGINIA BIG-EARED BAT (CORYNORHINUS TOWNSENDII VIRGINIANUS) AT THE PROPOSED STURGEON CREEK AND WAR FORK RESERVOIR SITES IN JACKSON COUNTY, KENTUCKY
U.S.G.S. McKee, Kentucky Topographic Quadangle
SCALE = 1:24000
ECO-TECH, INC.
ECO-SOUTH, INC.


Mps
Mp
Qal
Mp
Mps
Qal
ss
ss
ss
Pb
Qal
ss
Qal
ss
LEGEND
Mp = Pennington Formation
Mps = *sandstone member
Pb = Breathitt Formation
Qal = Alluvium
NORTH
PROJECT LOCATION MAP
PRELIMINARY SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (MYOTIS SODALIS) AND VIRGINIA BIG-EARED BAT (CORYNORHINUS TOWNSENDII VIRGINIANUS) AT THE PROPOSED STURGEON CREEK AND WAR FORK RESERVOIR SITES IN JACKSON COUNTY, KENTUCKY
U.S.G.S. Geologic Map of the McKee Quadangle
SCALE = 1:24000
ECO-TECH, INC.
ECO-SOUTH, INC.

STURGEON CREEK RESERVOIR SITE - MIST NET SITE E (UPSTREAM NET LOCATION)



STURGEON CREEK RESERVOIR SITE - MIST NET SITE E (DOWNSTREAM NET LOCATION)

SITE PHOTOGRAPHS

PRELIMINARY SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (*MYOTIS SODALIS*) AND VIRGINIA BIG-EARED BAT (*CORYNORHINUS TOWNSENDII VIRGINIANUS*) AT THE PROPOSED STURGEON CREEK AND WAR FORK RESERVOIR SITES

JACKSON COUNTY, KENTUCKY

AUGUST 11, 1999

ECO-TECH, INC.

ECO-SOUTH, INC.

RED BAT (*LASIURUS BOREALIS*) BAND NUMBER A00663

EASTERN PIPISTRELLE (*PIPISTRELLUS SUBFLAVUS*) BAND NUMBER A00664

SITE PHOTOGRAPHS

PRELIMINARY SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (*MYOTIS SODALIS*) AND VIRGINIA BIG-EARED BAT (*CORYNORHINUS TOWNSENDII VIRGINIANUS*) AT THE PROPOSED STURGEON CREEK AND WAR FORK RESERVOIR SITES

JACKSON COUNTY, KENTUCKY

AUGUST 12, 1999

ECO-TECH, INC.

ECO-SOUTH, INC.

NORTHERN LONG-EARED BAT (*MYOTIS SEPTENTRIONALIS*) BAND NUMBER A00662

BIG BROWN BAT (*EPTESICUS FUSCUS*) BAND NUMBER A00667

SITE PHOTOGRAPHS
PRELIMINARY SURVEY FOR THE FEDERALLY ENDANGERED INDIANA BAT (*MYOTIS SODALIS*) AND VIRGINIA BIG-EARED BAT (*CORYNORHINUS TOWNSENDII VIRGINIANUS*) AT THE PROPOSED STURGEON CREEK AND WAR FORK RESERVOIR SITES
JACKSON COUNTY, KENTUCKY
AUGUST 12, 1999

ECO-TECH, INC.

ECO-SOUTH, INC.

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