SURVEY OF BATS ALONG ROUTE 31 MARSHALL/St. JOSEPH COUNTIES, INDIANA

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SEPTEMBER 8, 2004

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THE BAT SPECIES OF INDIANA

Twelve species of bats have been captured in Indiana (Mumford and Whitaker, 1982), 3 species of solitary bats that live among the foliage of trees, 5 species of colonial bats of the genus Myotis, and 4 species of colonial bats in other genera. These are indicated below. Species that might be expected in summer in the study area are indicated by asterisk.

Solitary bats
*Hoary bat, *Lasiurus cinereus*
*Red bat, *Lasiurus borealis*
*Silver-haired bat, *Lasionycteris noctivagans* (migrator, early or late)

Bats of the genus *Myotis* (colonial)
*Little brown myotis, *Myotis lucifugus*
*Indiana myotis, *Myotis sodalis*
Gray myotis, *Myotis grisescens*
*Northern myotis, *Myotis septentrionalis (=Myotis keenii)*
Southeastern myotis, *Myotis austroriparius*

Other colonial bats
*Big brown bat, *Eptesicus fuscus*
*Eastern pipistrelle, *Pipistrellus subflavus*
*Evening bat, *Nycticeius humeralis*
Big-eared bat, *Plecotus rafinesquii*

Indiana and gray bats are federally endangered, whereas the evening bat is state endangered. The big-eared bat is considered as an accidental (from Kentucky) in Indiana, and the southeastern myotis is considered to be extirpated in the state. The gray myotis is a resident of the far southern portion of Indiana.

Big brown bats, little brown myotis, northern myotis, and red bats should be the most common bats in the general area of the study, and Indiana myotis, evening bats, hoary bats and eastern pipistrelles could occur. The silver-haired bat should occur in spring and fall during migration, but would not be expected much after June 1, or before September 1.

Bat species that have been taken previously in Marshall or St. Joseph counties (Mumford and Whitaker, 1982, Whitaker and Mumford, in prep.) are the

little brown myotis (*Myotis lucifugus),* Indiana myotis *(Myotis sodalis),* silver-haired bat *(Lasionycteris noctivagans),* eastern pipistrelle *(Pipistrellus subflavus),* big brown bat *(Eptesicus fuscus),* evening bat *(Nycticeius humeralis),* red bat (*Lasiurus borealis),* and hoary bat *(Lasiurus cinereus).*

SPECIES OF PARTICULAR CONCERN

Two species of bat listed as endangered in Indiana are of particular concern in this study by virtue of being resident (Indiana myotis- federally endangered) or at least have occurred (evening bat- state endangered) in this part of the state.

Myotis sodalis Indiana bat.

STATUS: FEDERALLY ENDANGERED

The Indiana bat spends the winter in large numbers in a few caves of southern Indiana and elsewhere. Maternity colonies usually occur under loose bark of trees, often, but not always, in riparian situations. Relatively few maternity colonies of this species have been found, including only 17 in Indiana through 2002 (Whitaker and Brack, 2002). Colonies are hard to locate because they are in trees, usually in wooded or semi-wooded areas, and there are relatively few bats in the colony, usually less than 100. The best way to locate maternity colonies is to attach a radio transmitter to an adult female bat and track her to the colony. Capture of female or juvenile Indiana bats in nets in summer suggests the presence of a nearby maternity colony, presumably with larger numbers of bats indicating that the colony is quite close. The Indiana bat has been found in St. Joseph but not Marshall County, and could easily be present in the project area.

Nycticeius humeralis Evening bat.

STATUS: STATE ENDANGERED

The evening bat in Indiana earlier formed maternity colonies in buildings, but all recent colonies have been found in hollow trees in woods. It is not known where this species hibernates, but we suspect it may be in hollow trees along larger streams to the south. The main populations of this species are in the lower Wabash River Valley from southern Vigo County south. Other colonies occur in Jennings County on the Muscatatuck River, one near the Indianapolis International Airport, and one at Atterbury primarily in Bartholomew County. This species has been taken in Marshall County, but is rare in northern Indiana and is not likely to be taken at the study site.

SPECIES MOST LIKELY TO BE PRESENT ON THE STUDY SITE, LISTED IN ORDER OF DECREASING PROBABILITY

Eptesicus fuscus. This is the most abundant bat in Indiana. In summer, most big brown bats form maternity colonies in buildings or other human-made structures. In winter, a few hibernate in caves and mines, but most hibernate in buildings, 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, 1992). This is the only species of bat that hibernates in buildings in Indiana. It is a common species in Marshall and St. Joseph counties and probably occurs at the study site.

Myotis lucifugus. The little brown myotis forms maternity colonies usually in buildings or other structures and it migrates to caves to hibernate. It is a species known to occur in Marshall and St. Joseph County, and could easily occur at the study site.

Lasiurus borealis. The red bat is solitary, but is one of the most common bats in Indiana. 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 in central Indiana. This species has been captured in both St. Joseph and Marshall Counties, and is likely to be present in the project area.

SPECIES MUCH LESS LIKELY TO OCCUR AT STUDY SITE

Lasiurus cinereus. The hoary bat is the largest bat of Indiana and is one of the most colorful. Like the red bat, in summer it hangs in foliage in the daytime, but most individuals migrate far south for the winter, to southern California, Central America and a few to coastal South Carolina. It is possibly present at the study site, but it is quite uncommon thus likely not to be taken in a limited survey.

Myotis septentrionalis. The northern myotis was earlier referred to as Keen's myotis, *Myotis keenii*, but Keen's myotis is currently recognized as a separate species which occurs only in northwestern North America. This species usually forms relatively small maternity colonies in cracks or crevices or under the loose bark of trees, and occasionally in buildings. In winter, it is solitary and hibernates in caves and mines with most individuals not being seen because they hibernate in tiny cracks or other hidden places. This is a common species in the woods of southern Indiana and could occur in Marshall or St. Joseph County.

Pipistrellus subflavus. The pipistrelle is the smallest bat in Indiana. It sometimes forms small maternity colonies in buildings, but most individuals in summer are found in woods where they live in clusters of leaves. In winter it is a solitary hibernator in caves and mines. It has been found in St. Joseph County, and could occur at the study site, but is not likely to be taken there in a limited survey in summer.

Lasionycteris noctivagans. The silver-haired bat is a distinctively colored migratory species. It undoubtedly migrates through the study area in spring (most in mid April and May) and fall (September to November) but should not be present in summer much after June 1. It has its young in hollows in trees to the north of Indiana, and then moves south to hibernate. Little is known of its hibernation sites, but the northern edge of its winter range is in central Indiana. A very few hibernate in caves and mines of southern Indiana and some may hibernate in trees. It has been found in St. Joseph County, but is not likely to be taken in a limited survey, especially in summer.

METHODS

Two nights of netting for bats occurred at each selected site (Map 1 & 2) along route 31, each with two nets. Mist-nets do not work well unless they extend upward to a tree canopy. If no canopy is present the bats generally sense and fly over the net.

Nets were stretched across the stream or other flyway between aluminum telescoping poles rigged with ropes and pulleys. Mist-nets were placed one above the other so as to reach the canopy in the sites netted. Nets were generally monitored from dusk to 12 AM. Bat detectors were used constantly to monitor bat activity in the vicinity of the nets. This allowed for a determination of usage of the areas by bats, and also gave an assessment of how well the nets were doing. Few calls on the detector (less than 30-40) indicated little use of the site by bats. Numerous calls on the detector, but no bats in the net indicated that the net should be repositioned.

RESULTS AND DISCUSSION

No federally listed bats were detected at any of these sites. A total of 25 bats were netted and released unharmed during this project (Appendix 1). They included 22 big brown bats, Eptesicus fuscus, and 3 red bats, *Lasiurus borealis* (Table 1). We had one bat fatality (*Lasiurus borealis*) at site 2. The red bat got tangled in the net in such a way that she died before we could rescue her. The specimen is deposited in the mammal collection at Indiana State University. The above listed sites along the proposed route of Rt. 31 seem to be utilized by predominantly big brown bats and red bats. Both species are commonly found throughout the state and the proposed route should not have any significant affect on these species.

LITERATURE CITED

Mumford, R. E. and J. O. Whitaker, Jr. 1982. Mammals of Indiana. Indiana University Press. Bloomington. 537 pp.

Whitaker, J. Jr. and V. Brack, Jr. 2003. Distribution and summer ecology in Indiana. Pp 48-54 In: The Indiana bat: biology and management of an endangered species. Eds. A. Kurta and J. Kennedy. Bat Conservation International, Austin Texas. 253 p.

Whitaker, J. O. Jr. and S. L. Gummer. 1992. Hibernation of the big brown bat, Eptesicus fuscus, in buildings. Journal of Mammalogy 73:312-316.

Whitaker, J. O. Jr. and R. E. Mumford. Mammals of Indiana.

In prep.

TABLE 1. SUMMARY OF BATS TAKEN ALONG PROPOSED ROUTE 31 IN MARSHAL AND ST. JOSEPH COUNTIES, INDIANA

Site #	*Eptesicus fuscus*	*Lasiurus borealis*
1	0	0
2	16	2
3	0	0
4	6	1
Total	22	3

APPENDIX 1

Site # 1. Indiana: Marshall County; La Paz Quadrangle; T34N R2E; south central portion of section 4, 45867 x 5586.

Habitat: Open deciduous wood lot containing cottonwood and maple species, canopy coverage between 50 – 70%; no stream. Potential roost trees available, but lacking water source

12 July 2004: 8:25 pm – 12:00 am
Weather: 72 F, Wind none. Precipitation none.

NO BATS WERE CAUGHT AND 1 CALL HEARD ON DETECTOR.

17 July 2004: 8:05 pm – 12:00 am
Weather: 70 F, Wind none. Precipitation none.

NO BATS WERE CAUGHT AND 1 CALL HEARD ON DETECTOR.

Site # 2. Indiana: Marshal County; La Paz Quadrangle; T35N R2E; west central portion of section 22, 45908 x 5594.

Habitat: Deciduous wood lot containing cottonwood, ash, oak, and maple species, Canopy coverage 75-100%. Stream 2-5 ft wide to 2-4 in deep, sand bottom, channel 12 wide, bank height 12 ft. Potential roost trees available.

13 July 2004: 8:30 pm – 9:30 pm
Weather: 70 F, Winds high, severe thunderstorms.

BATS TAKEN	Net #	SEX	TIME	COND
Lasiurus borealis	1	F	9:10	Non-reprod.
Eptesicus fuscus	2	F	9:00	Non-reprod.
Eptesicus fuscus	2	F	9:02	Non-reprod.
Eptesicus fuscus	2	F	9:05	Lactating

NET TAKEN DOWN DUE TO STORMS.

14 July 2004: 8:00 pm – 12:00 am
Weather: 72 F, Wind minimal, precipitation none.

BATS TAKEN	Net #	SEX	TIME	COND
Eptesicus fuscus	1	F	9:10	Non-reprod.
Eptesicus fuscus	1	M	10:00	Non-reprod.
Lasiurus borealis	1	F	10:23	Non-reprod.
Eptesicus fuscus	2	F	9:18	Non-reprod.
Eptesicus fuscus	2	M	10:05	Non-reprod.
Eptesicus fuscus	2	F	10:25	Lactating

15 CALLS HEARD ON DETECTORS.

18 July 2004: 8:30 pm – 12:00 am
Weather: 67 F, Wind none, precipitation none.

BATS TAKEN	Net #	SEX	TIME	COND
Eptesicus fuscus	1	M	9:22	Testes Des.
Eptesicus fuscus	2	M	9:13	Testes Des.
Eptesicus fuscus	2	M	9:37	Testes Des.
Eptesicus fuscus	2	M	9:45	Non-reprod.
Eptesicus fuscus	2	M	10:03	Testes Des.
Eptesicus fuscus	2	F	10:12	Lactating
Eptesicus fuscus	2	M	10:26	Testes Des.
Eptesicus fuscus	2	M	10:30	Non-reprod.

29 CALLS HEARD ON DETECTORS.

Site # 3. Indiana: St. Joseph County; Wyatt Quadrangle; T36N R2E; northwest portion of section 25, 45996 x 5627.

Habitat: Deciduous forest lot bordered by open field, Canopy coverage 75-100%. Stream 10 ft wide to 3 in deep, Bank height 6 ft and heavily wooded and brushy, silt/ mud bottom. Narrow flyway.

15 July 2004: 8:10 pm – 12:00 am
Weather: 65 F, wind none, precipitation none.

NO BATS WERE CAUGHT AND 24 CALLS HEARD ON DETECTORS MOSTLY FROM BATS SEEN FLYING IN ADJACENT FIELD.

19 July 2004: 8:00 pm – 12:00 am
Weather: 66 F, wind none, precipitation none.

NO BATS WERE CAUGHT AND 57 CALLS HEARD ON DETECTORS MOSTLY FROM BATS SEEN FLYING IN ADJACENT FIELD.

Site # 4. Indiana: St. Joseph County; Lakeville Quadrangle; T36N R2E; north east portion of section 10, 46045 x 5603.

Habitat: Open deciduous forest lot that had been recently clear cut along the stream edge, Canopy coverage 10-20 %. Stream 5 ft wide and 3 in deep, bank height 6 ft, channel width 10 ft, sand/silt bottom. Wide open flyway.

20 July 2004: 8:00 pm – 12:00 am
Weather: 69 F, wind minimal, precipitation none.

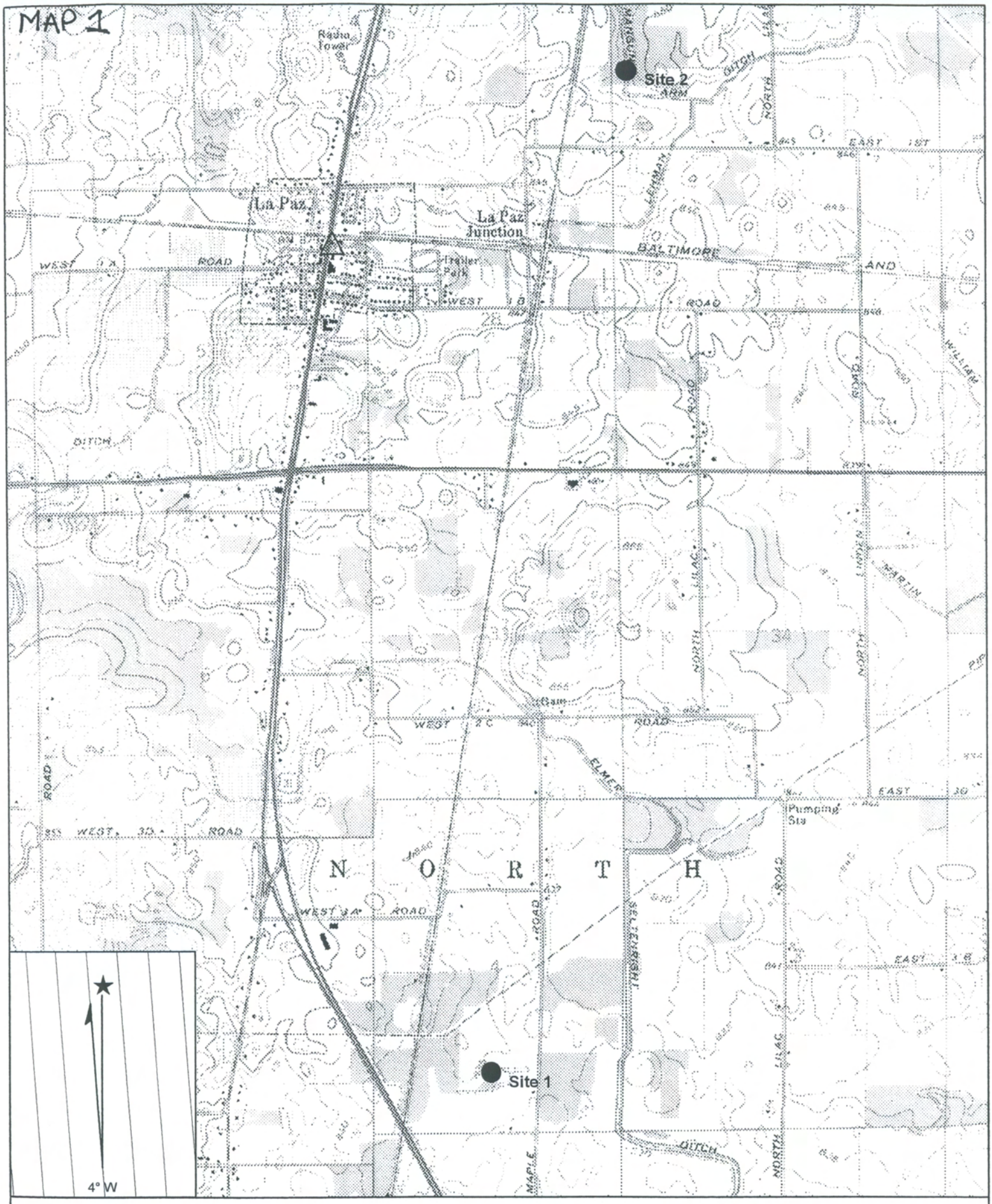
BATS TAKEN	Net #	SEX	TIME	COND
Lasiurus borealis	1	M	9:29	Non-reprod.
Eptesicus fuscus	2	M	9:20	Non-reprod.
Eptesicus fuscus	2	M	10:08	Testes Des.
Eptesicus fuscus	2	M	10:42	Testes Des.

62 CALLS HEARD ON DETECTORS.

22 July 2004: 8:20 pm – 12:00 am
Weather: 74 F, wind moderate, misting precipitation.

BATS TAKEN	Net #	SEX	TIME	COND
Eptesicus fuscus	1	M	9:12	Non-reprod.
Eptesicus fuscus	2	M	9:15	Testes Des.
Eptesicus fuscus	2	M	9:30	Testes Des.

10 CALLS HEARD ON DETECTORS.



Name: LA PAZ
Date: 9/20/2004
Scale: 1 inch equals 2000 feet

Location: 041° 26' 38.22" N 086° 17' 53.7" W
Caption: Map 1 -- Site 1 _2

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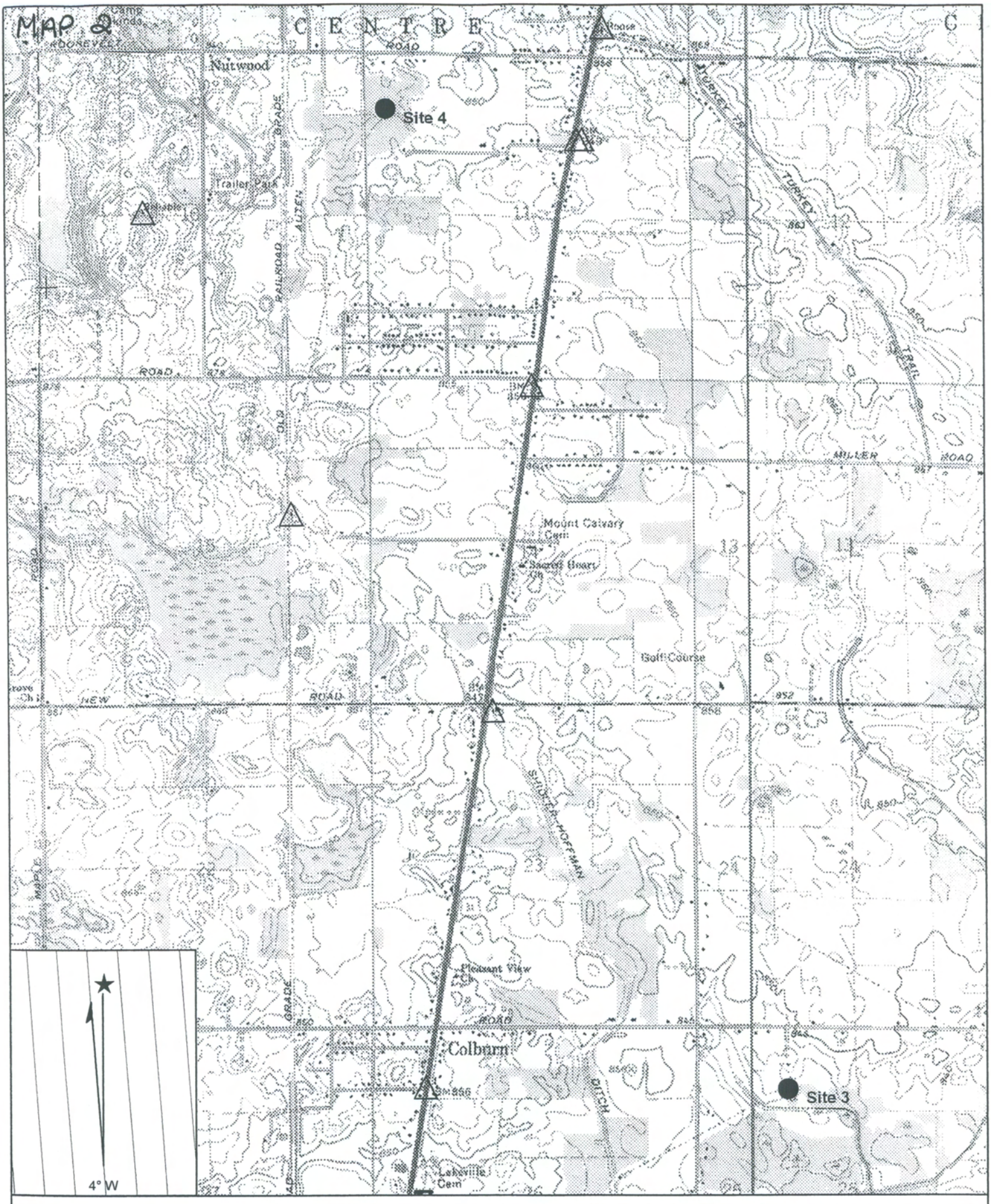

Name: LAKEVILLE
Date: 9/20/2004
Scale: 1 inch equals 2000 feet

Location: 041° 34' 09.19" N 086° 15' 54.10" W
Caption: Map 2 -- Site 3 _4

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I-69 NET SITE DESCRIPTION

(Photographs of Net Sites are Encouraged)

Date: 12 July 2004 Section #: _____ Site #: 1 County: Marshal

Quad. Name: _____ GPS: N_____._____ E _____ Zone _____S

Approximate Distance to the Working Alignment of I-69 (ft. or mi.): _____

Property/Site Name: _____ Stream Name: N/A

Biologists' Names: J. Whitaker, C. Wozencraft, H. Brockhart, A. Fairbairn, E. Cunningham, L. Renner

Comments: _____

STREAM N/A

- Bank height (ft): _____
- Channel width (ft): _____ Water width (ft): _____
- Substrate: _____ Average water depth (in, ft): _____
- Turbidity (circle): high medium low

VEGETATION

- % Canopy closure (visual estimate): Net #1 70 Net #2 50
- Dominant canopy species (16" dbh or greater)

  Maple, Cottonwood

  _____

- Estimated average DBH of dominant canopy trees(cm): 12 cm
- Dominant subcanopy species: _____

  _____

- Relative "Openness" of subcanopy (circle): (high) medium low

SKETCH : On the backside of this sheet, please provide a sketch of the net site showing the relative positions of the net sets (labeled #1 and #2) to one another and to surrounding natural and manmade features including water sources, roads, trails, bridges, mines/caves, fence lines, woodlots, fields/pasture, wetlands, houses, buildings, large trees, and any other distinctive landmarks. Also include a North arrow and location of Anabat II detector.

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 12 July 2004 Section #: _____ Site #: 1 County: Marshall GPS: N_____.___ E_____ Zone _____S

Consulting Firm's Name_____ Biologists' Names: Whitaker, Wozencraft, Brockhart, Fairbairn, Cunningham, Rennier

Name of Property (if any):_____ Property Owner's Name:_____

No. of Net Sets: 2 Net # (1 or 2): 1 Net Size: 30 ft wide x 15 ft high Feature netted (e.g., road, creek, pond): woods

Net Up Time: 2025 Net Down Time: 2355

~72°F

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments TL/T/HF/E/TR
	NO BATS CAUGHT											

BAT CALLS: NONE

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)

[2] P = pregnant, L = lactating, PL = post-lactating, NR = non-reproductive, D = descended testes, Unk. = Unknown.

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 12 July 2004 Section #: _____ Site #: 1 County: Marshall GPS: N_____.___ E_____ Zone _____S

Consulting Firm's Name_____ Biologists' Names: Whitaker, Wozencraft, Brookhart, Fairbairn, Cunningham Kerner

Name of Property (if any):_____ Property Owner's Name:_____

No. of Net Sets: 2 Net # (1 or 2): 2 Net Size: 30 ft wide x 12 ft high Feature netted (e.g., road, creek, pond): woods

Net Up Time: 2035 Net Down Time: 2355

~72°F

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments TL/T/HF/E/TR

CALLS 2241

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)

[2] P = pregnant, L = lactating, PL = post-lactating, NR = non-reproductive, D = descended testes, Unk. = Unknown.

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 17 July 2004 Section #: ____ Site #: 1 County: Marshall GPS: N____.___ E____ Zone ____S
Consulting Firm's Name____ Biologists' Names: Brockhart, Renner, Cunningham
Name of Property (if any):____ Property Owner's Name:____
No. of Net Sets: 1 Net # (1 or 2): both Net Size: 27 ft wide x 15 ft high Feature netted (e.g., road, creek, pond): woods
Net Up Time: 2005 Net Down Time: 2400

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments
	NO BATS CAUGHT											

Call 2140

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)
[2] P = pregnant, L = lactating, PL = post-lactating, NR = non-reproductive, D = descended testes, Unk. = Unknown.

I-69 NET SITE DESCRIPTION

(Photographs of Net Sites are Encouraged)

Date: 7-14-04 Section #: _____ Site #: 2 County: Marshal

Quad. Name: LaPaz GPS: N _____ . _____ E _____ Zone _____ S

Approximate Distance to the Working Alignment of ~~I-69~~ US-31 (ft. or mi.): 500 Ft. (?)

Property/Site Name: _____ Stream Name: _____

Biologists' Names: Heather Brookhart, Lindsay Renner, Amy Fairbairn, Elizabeth Cunningham

Comments: _____

STREAM

- Bank height (ft): 10-12 Ft
- Channel width (ft): 10-12 Ft Water width (ft): 2-5 Ft
- Substrate: Sand Average water depth (in, ft): 2-4 in
- Turbidity (circle): high medium (low)

VEGETATION

- % Canopy closure (visual estimate): Net #1 75 Net #2 75-100
- Dominant canopy species (16" dbh or greater)

  Green Ash, Quaking Aspen, Sugar Maple, Oak, Cottonwood, Silver Maple
- Estimated average DBH of dominant canopy trees(cm): 24 cm - 30 cm
- Dominant subcanopy species: _____
- Relative "Openness" of subcanopy (circle): (high) medium low

SKETCH : On the backside of this sheet, please provide a sketch of the net site showing the relative positions of the net sets (labeled #1 and #2) to one another and to surrounding natural and manmade features including water sources, roads, trails, bridges, mines/caves, fence lines, woodlots, fields/pasture, wetlands, houses, buildings, large trees, and any other distinctive landmarks. Also include a North arrow and location of Anabat II detector.

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 13/14 July 2004 Section #: ____ Site #: 2 County: Marshall GPS: N____.___ E____ Zone ____S

Consulting Firm's Name ____ Biologists' Names: ____

Name of Property (if any): ____ Property Owner's Name: ____

No. of Net Sets: 1 Net # (1 or 2): 1 Net Size: ____ ft wide x ____ ft high Feature netted (e.g., road, creek, pond): stream

Net Up Time: 2030 / 2000 Net Down Time: ____

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments TL/T/HF/E/TR
13th	Red bat Lasiurus borealis	F	J	NR	/	41	2110	/	/	/	/	107/42/7/+
14th	Big Brown	F	A	L	/	52	2135	/	/	/	/	102/37/7/12/5
62°	Big Brown	M			/	48	2200	/	/	/	/	106 ~~152~~/31/7/11/4
	Red bat	M	A		/		2223	/	/	/	/	Strangled in net

2220 - bat call 2350 - bat call

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)

[2] = lactating, PL = post-lactating, NR = non-reproductive, D = descended testes, Unk. = Unknown.

TL - T - HF - E - FA - TR

BAT CALLS: 2030; 2101; 2104; 2113; 2137; 2143 2153; 2157; 2202; 2210; 2212 2322; 2335

TL; T; ~~E~~ HF; E; FA; TR

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 7/13/04 Section #: _____ Site #: 2 County: _____ GPS: N _____ . ___ E _____ Zone ____S

Consulting Firm's Name _____ Biologists' Names: _____

Name of Property (if any): _____ Property Owner's Name: _____

No. of Net Sets: _____ Net # (1 or 2): 2 Net Size: ____ ft wide x ____ ft high Feature netted (e.g., road, creek, pond): _____

Net Up Time: 13 July 2100 - / 14 July 2000 Net Down Time: 13 July ~~2130~~

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments
	T=47; HF=10; E=16; TR=7; FA=46 big brown TL=120	F	~~JUV~~ ~~ADT~~	Not Preg.			2100					~~Big Brn~~ In net awhile
	TL=118; T44; E12; HF ; ~~F~~=10 big brown FA 48; TR 5	F	~~JUV~~ ~~A~~				21:00					"
	Big Brown TR TL ; T ; E ; HF ; F ; FA	F	A	L			12+9=21 21:00					"
	- - - - -											
1/14	Big Brown TL 100; T 42; E 15; HF 10; FA 48; TR 5	F	A	NR			2118					
	119-44-10-14-50-6 Big Brown	m	A				2205					
73 47 120	Big Brown 120-47-11-14-51-5	F	A	L			2325					

[illegible]nk. = unknown (i.e., escaped prior to determination)

[illegible]PL = post-lactating, NR = non-reproductive, D = descended testes, Unk. = Unknown.

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 18 July 2004 Section #: ____ Site #: 2 County: Marshall GPS: N____.___ E____ Zone ____S
Consulting Firm's Name ____ Biologists' Names: E. Cunningham, L. Renner
Name of Property (if any): ____ Property Owner's Name: ____
No. of Net Sets: 2 Net # (1 or 2): #1 Net Size: 27 ft wide x 18 ft high Feature netted (e.g., road, creek, pond): Creek
Net Up Time: 2030 Net Down Time: 2355

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments
	Eptesicus fuscus	M	A	D		45	2122					

BAT CALLS: 2114, 2116, 2117, 2132, 2135, 2142, 2148, 2150, 2152, 2155, 2158, 2210, 2216, 2225, 2232, 2237
2248, 2251, 2255, 2258
↑ BAT

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)
[2] P = pregnant, L = lactating, PL = post-lactating, NR = non-reproductive, D = descended testes, Unk = Unknown

BAT CALL: 2104 2113 2137, 2140 2150
2152 2254 2258 2332

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 18 July Section #: _____ Site #: 2 County: Marshall GPS: N_____.___ E_____ Zone ____S
Consulting Firm's Name _____ Biologists' Names: Brookhart, Wozencraft
Name of Property (if any): _____ Property Owner's Name: _____
No. of Net Sets: 2 Net # (1 or 2): 2 Net Size: 27 ft wide x 15 ft high Feature netted (e.g., road, creek, pond): creek
Net Up Time: 2020 Net Down Time: 2400

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments
	EPTESICUS fuscus BIG BROWN	M	A	TES. DES.		47	2113					
	"	M	A	"		45	2137					
	"	M	J	IMM.		45	2145					
	"	m	A	TES. DES.		50	2203					
	"	F	A	L.		48	2212					
	"	M	J	D		44	2226					
	"	M	J	imm		45	2230					

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)
[2] P = pregnant, L = lactating, PL = post-lactating, NR = non-reproductive, D = descended testes, Unk. = Unknown.

I-69 NET SITE DESCRIPTION

(Photographs of Net Sites are Encouraged)

Date: 7/15/04 Section #: — Site #: 3 County: Marshall

Quad. Name: Lakeville GPS: N_____ E _____ Zone ____ S

Approximate Distance to the Working Alignment of I-69 (ft. or mi.): west edge of R/W

Property/Site Name: _____ Stream Name: unnamed

Biologists' Names: R. Yeager, Heather Brookhart, Lindsay Renner, Elizabeth Cunningham

Comments: _____

STREAM

- Bank height (ft): 6'
- Channel width (ft): 12' Water width (ft): 10'
- Substrate: silt/mud Average water depth (in, ft): 3 in.
- Turbidity (circle): high medium (low)

VEGETATION

- % Canopy closure (visual estimate): Net #1 75-100% Net #2 75/100%
- Dominant canopy species (16" dbh or greater)

_____

_____

- Estimated average DBH of dominant canopy trees(cm): _____
- Dominant subcanopy species: _____

_____

- Relative "Openness" of subcanopy (circle): high (medium) low

SKETCH : On the backside of this sheet, please provide a sketch of the net site showing the relative positions of the net sets (labeled #1 and #2) to one another and to surrounding natural and manmade features including water sources, roads, trails, bridges, mines/caves, fence lines, woodlots, fields/pasture, wetlands, houses, buildings, large trees, and any other distinctive landmarks. Also include a North arrow and location of Anabat II detector.

Call Times: 2038; 2041; 2043; 2044; 2053; 2055; 2110; 2112; 2120; 2130; 2140; 2147; 2150; 2200; 2215; 2255; 2310; 2320
2330

Most calls were in adjacent Field to north

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 7/15/04 Section #: ____ Site #: 3 County: ~~Marshall~~ St. Joseph GPS: N____.___ E____ Zone ____S

Consulting Firm's Name BLA / ISU Biologists' Names: R. Yeager; L. Reiner

Name of Property (if any): NA Property Owner's Name: ____

No. of Net Sets: 2 Net # (1 or 2): 1 Net Size: ____ ft wide x ____ ft high Feature netted (e.g., road, creek, pond): ____

Net Up Time: 2010 Net Down Time: 2400

70°F

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments

= male, F = female, Unk. = unknown (i.e., escaped prior to determination)

egnant, L = lactating, PL = post-lactating, NR = non-reproductive, D = descended testes, Unk. = Unknown.

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 15 July 2004 Section #: _____ Site #: 3 County: St. Joseph Co. GPS: N_____.___ E_____ Zone ____S
Consulting Firm's Name_____ Biologists' Names: H. Brookhart, E. Cunningham
Name of Property (if any):_____ Property Owner's Name:_____
No. of Net Sets: 2 Net # (1 or 2): 2 Net Size: ____ ft wide x ____ ft high Feature netted (e.g., road, creek, pond): creek
Net Up Time: 2045 Net Down Time: 2400

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments
	NO BATS CAUGHT											

BAT CALLS: 2109, 2125, 2129, 2142, 2147

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)
[2] P = pregnant, L = lactating, PL = post-lactating, NR = non-reproductive, D = descended testes, Unk. = Unknown

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 19 July 2004 Section #: ____ Site #: 3 County: St. Joseph GPS: N____.___ E____ Zone ____S
Consulting Firm's Name____ Biologists' Names: E. Cunningham, L. Renner
Name of Property (if any):____ Property Owner's Name:____
No. of Net Sets: 1 Net # (1 or 2): 1 Net Size: 27 ft wide x 10 ft high Feature netted (e.g., road, creek, pond): creek
Net Up Time: 2000 Net Down Time: 2400

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments
	NO BATS CAUGHT											
*	All calls are from the open field to the north											

*BAT CALLS: 2045, 2048, 2057, 2100, 2103, 2105, 2113, 2116, 2121, 2125, 2127, 2133, 2135, 2138, 2148, 2145, 2148, 2152 2200, 2204, 2216, 2218, 2223, 2225, 2227, 2230, 2236, 2241, 2243, 2250, 2259, 2305, 2307, 2309, 2311, 2314, 2317, 2319, 2321, 2324, 2328, 2332, 2335, 2343, 2346

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)
[2] P = pregnant, L = lactating, PL = post-lactating, NR = non-reproductive. D = descended testes Unk = Unknown

BAT CALLS: 2042 2053 2119 2130
2140 2206 2210 2251
2256 2320

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 19 July 2004 Section #: ____ Site #: 3 County: St. Joseph GPS: N____.___ E_____ Zone ____S
Consulting Firm's Name_____ Biologists' Names: H. Brookhart
Name of Property (if any):_____ Property Owner's Name:_____
No. of Net Sets: 2 Net # (1 or 2): 2 Net Size: 30 ft wide x 10 ft high Feature netted (e.g., road, creek, pond): creek
Net Up Time: 2030 Net Down Time: 2400

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments
	NO BATS CAUGHT											

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)
[2] P = pregnant, L = lactating, PL = post-lactating, NR = non-reproductive, D = descended testes, Unk. = Unknown.

I-69 NET SITE DESCRIPTION

(Photographs of Net Sites are Encouraged)

Date: 20 July 2004 Section #: _____ Site #: 4 County: St. Joseph

Quad. Name: _____ GPS: N _____ . _____ E _____ Zone ____ S

Approximate Distance to the Working Alignment of I-69 (ft. or mi.): _____

Property/Site Name: _____ Stream Name: _____

Biologists' Names: H. Brockhart, L. Benner, E. Cunningham, R. Yeager, J. Mosely

Comments: _____

STREAM

- Bank height (ft): 6 ft
- Channel width (ft): 10ft Water width (ft): 5 ft
- Substrate: sand/silt Average water depth (in, ft): 3 in
- Turbidity (circle): high medium (low)

VEGETATION

- % Canopy closure (visual estimate): Net #1 30 Net #2 20
- Dominant canopy species (16" dbh or greater)

  Sycamore, Basswood, Locust

- Estimated average DBH of dominant canopy trees(cm): 10 cm
- Dominant subcanopy species: _____
- Relative "Openness" of subcanopy (circle): (high) medium low

SKETCH : On the backside of this sheet, please provide a sketch of the net site showing the relative positions of the net sets (labeled #1 and #2) to one another and to surrounding natural and manmade features including water sources, roads, trails, bridges, mines/caves, fence lines, woodlots, fields/pasture, wetlands, houses, buildings, large trees, and any other distinctive landmarks. Also include a North arrow and location of Anabat II detector.

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 20 July 2004 Section #: ____ Site #: 4 County: St. Joseph GPS: N_____.___ E_____ Zone ____S
Consulting Firm's Name_____ Biologists' Names: H. Brackhart, L. Remer, E. Cunningham, R. Yeager
Name of Property (if any):_____ Property Owner's Name: J. Moseley
No. of Net Sets: 2 Net # (1 or 2): 1 Net Size: 30 ft wide x 18 ft high Feature netted (e.g., road, creek, pond): stream
Net Up Time: 2000 Net Down Time: 2400

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments
	Lasiurus borealis	m	J	immature		37	2129					72° F

BAT CALLS: 2021, 2023, 2025, 2030, 2037, 2042, 2048, 2054, 2100, 2106, 2110, 2117, 2124, 2129, 2141, 2146, 2152, 2158, 2207, 2213, 2219, 2227, 2232, 2241, 2255, 2302, 2308, 2313, 2330, 2340

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)
[2] P = pregnant, L = lactating, PL = post-lactating, NR = non-reproductive, D = descended testes, Unk = Unknown

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 20 July 2004 Section #: ____ Site #: 4 County: St. Joseph GPS: N____.____ E____ Zone ____S

Consulting Firm's Name ____ Biologists' Names: Cunningham; Renner; Brookhart

Name of Property (if any): ____ Property Owner's Name: ____

No. of Net Sets: ____ Net # (1 or 2): 2 Net Size: 30 ft wide x 15 ft high Feature netted (e.g., road, creek, pond): Creek

Net Up Time: 8:30 PM Net Down Time: 12:00 AM

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments
	Eptesicus fuscus Big Brown Bat	M	A	NR			2120					FA=46 72° F
	Big Brown Bat	m	A	D			2208					FA = 45 74° F
	Big Brown Red Bat Bat	m	A	D			2242					FA = 48 ~~67° F~~ 72 °F

Calls: 2028; 2030; 2035; 2040; 2045; 2050; 2100; 2105; 2110; 2115; 2120; 2125; 2130; 2140; 2145; 2150; 2155; 2205; 2210; 2220; 2225; 2235; 2240; 2245; 2255; 2300; 2305; 2320; 2330; 2335; 2345; 2350;

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)

[2] P = pregnant, L = lactating, PL = post-lactating, NR = non-reproductive, D = descended testes, Unk = Unknown

BAT CALLS: 2025 2030 2035 2045 2050 2055 2105 2110 2200 2205

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 22 July 2004 Section #: ____ Site #: 4 County: St. Joseph GPS: N____.___ E____ Zone ____S
Consulting Firm's Name ____ Biologists' Names: H. Brookhart, E. Cunningham, L. Renner
Name of Property (if any): ____ Property Owner's Name: ____
No. of Net Sets: 2 Net # (1 or 2): 1 Net Size: ____ ft wide x ____ ft high Feature netted (e.g., road, creek, pond): creek
Net Up Time: 20:20 Net Down Time: ~~2300~~ 2400

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments
	Eptesicus fuscus	M	J	NR		42	2112					~~Ex = 42~~ 71°

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)
[2] P = pregnant, L = lactating, PL = post-lactating, NR = non-reproductive, D = descended testes, Unk. = Unknown

I-69 BAT CAPTURE DATA SHEET

(Complete for Each Net)

Date: 22 July 2004 Section #: ____ Site #: 4 County: St. Joseph GPS: N_____.___ E_____ Zone ____S
Consulting Firm's Name_____ Biologists' Names: Lindsay Renner, Elizabeth Cunningham, Heather Brookhart
Name of Property (if any):_____ Property Owner's Name:_____
No. of Net Sets: 2 Net # (1 or 2): 2 Net Size: 30 ft wide x 18 ft high Feature netted (e.g., road, creek, pond): ~~Creek~~ Stream
Net Up Time: 2020 Net Down Time: 2400

#	Species	Sex[1]	Age (A or J)	Repro. Condi[2]	Wt (g)	RFA (mm)	Capture Time (military)	Band No. & Color (male – right, female left)	Radio Freq.	Pic #	Guano - G Hair - H	Comments
	Eptesicus fuscus Big Brown Bat	M	A	D		48	2115					71° F
	Eptesicus fuscus	M	A	D		45	2130					70° F

[1] M = male, F = female, Unk. = unknown (i.e., escaped prior to determination)
[2] P = pregnant, L = lactating, PL = post-lactating, NR = non-reproductive. D = descended testes Unk = Unknown